

**SEVENTH FIVE-YEAR REVIEW REPORT FOR
COLBERT LANDFILL SUPERFUND SITE
SPOKANE COUNTY, WASHINGTON**



SEPTEMBER 2024

Prepared by

**U.S. Environmental Protection Agency
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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DCA	Dichloroethane
DCE	Dichloroethylene
Ecology	Washington Department of Ecology
EPA	United States Environmental Protection Agency
FAFB	Fairchild Air Force Base
FS	Feasibility Study
FYR	Five-Year Review
gpm	Gallons Per Minute
HQ	Hazard Quotient
IC	Institutional Control
ICIAP	Institutional Control Implementation and Assurance Plan
IROD	Interim Record of Decision
MAC	Maximum Acceptable Concentration
MCL	Maximum Contaminant Level
MFS	Minimal Functional Standard
µg/L	Micrograms per Liter
MTCA	Model Toxics Control Act
NCP	National Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PCE	Tetrachloroethylene
PFAS	Per- and Polyfluoroalkyl Substances
PFOA	Perfluorooctanoic Acid
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI	Remedial Investigation
RPM	Remedial Project Manager
RSE	Remediation System Evaluation
RSL	Regional Screening Level
TCA	Trichloroethane
TCE	Trichloroethylene
UU/UE	Unlimited Use and Unrestricted Exposure
VOC	Volatile Organic Compound

I. INTRODUCTION

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if the remedy is and will continue to be protective of human health and the environment. The methods, findings and conclusions of reviews are documented in FYR reports such as this one. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)) and considering EPA policy.

This is the seventh FYR for the Colbert Landfill Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE). The Site consists of one operable unit (OU), which addresses contaminated groundwater surrounding the landfill.

EPA remedial project manager (RPM) Ravi Sanga led the FYR with support from Skeo, EPA's contractor. Kristin Beck from the Washington Department of Ecology (Ecology) also participated. Spokane County, one of the potentially responsible parties (PRPs), was notified of the initiation of the FYR. The review began on October 10, 2023.

Site Background

The Site consists of a groundwater contaminant plume that surrounds a closed 40-acre municipal solid waste landfill in a semi-rural area about 2 miles north of Colbert, Washington, and 15 miles north of Spokane, Washington (Figure 1). The groundwater contaminant plume associated with the Site extends to the Little Spokane River about 3,000 feet to the west, more than a mile to the south, and several thousand feet north and east of the closed landfill. A groundwater treatment system, currently in standby mode, is located next to the landfill. Spokane County ran the landfill from 1968 to 1986. During that time, the landfill received household and commercial waste. From 1975 to 1980, the landfill accepted solvent and other chemical wastes from several entities, including Key Tronic Corporation (a local electronic manufacturing company) and Fairchild Air Force Base (FAFB). The disposal of solvent wastes at the landfill contaminated groundwater with volatile organic compounds (VOCs).

Surrounding land uses are mostly suburban residential areas with some agricultural uses, mainly crop and livestock production. The Spokane County Regional Solid Waste Transfer Station is directly west of the landfill (Figure 1). There are residences to the north and east of the landfill, and some of these residences are on private domestic wells. All residential wells in the area surrounding the Site are sampled regularly through the Residential Monitoring Program (see Table 3 for the monitoring schedule). Based on the results from the most recent sampling event in 2024, VOC concentrations were below maximum contaminant level (MCL). Some residences near the Site were connected to the public water supply due to groundwater contamination detected at the time of the Site's 1987 Interim Record of Decision (IROD). The Whitworth Water District supply lines now extend to much of the

impacted area. However, there are still 35 residences who continue to obtain water from private wells.

The geology consists of vertically stratified and laterally discontinuous geologic units. There are three aquifers defined at the Site:

- Upper aquifer: unconfined sand and gravel; flows southwest and south.
- The Lower aquifer is confined west of the landfill and unconfined east of the landfill, consists of sand and gravel, and flows predominantly to the west with discharge to the Little Spokane River.
- The Basalt aquifer is interbedded and forms a secondary aquifer that appears to be of limited extent.

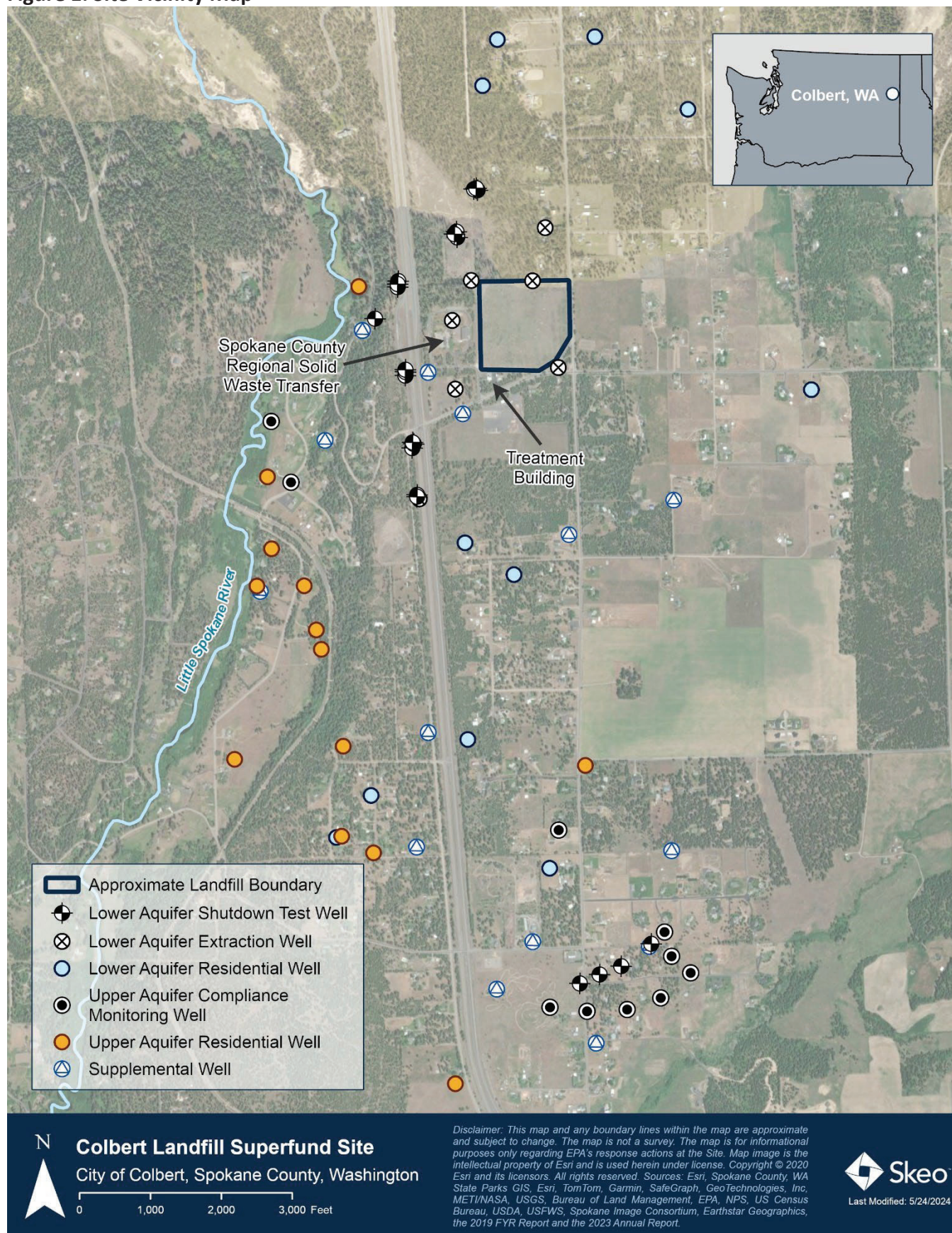
The Site's hydrogeology is complex and impacts contaminant distribution. A schematic of the geologic units and their distribution is provided in Figure D-1 in Appendix D.

Appendix A provides a list of site-related information resources. Appendix B provides the Site's chronology of events.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Colbert Landfill		
EPA ID: WAD980514541		
Region: 10	State: WA	City/County: Colbert/Spokane
SITE STATUS		
NPL Status: Final		
Multiple OUs? No	Has the Site achieved construction completion? Yes	
REVIEW STATUS		
Lead agency: EPA		
Author name: Ravi Sanga, with support provided by Skeo		
Author affiliation: EPA Region 10		
Review period: 10/10/2023 – 9/26/2024		
Date of site inspection: 4/30/2024		
Type of review: Statutory		
Review number: 7		
Triggering action date: 9/26/2019		
Due date (<i>five years after triggering action date</i>): 9/26/2024		

Figure 1: Site Vicinity Map



II. RESPONSE ACTION SUMMARY

Basis for Taking Action

In 1980, nearby residents complained to Ecology about the chemical disposal practices at the Colbert Landfill. EPA, Ecology, and the Spokane County Utilities Department sampled nearby domestic water wells. Twenty domestic wells had contaminants above drinking water standards. In August 1983, EPA added the Site to the Superfund program's National Priorities List (NPL). EPA identified Spokane County, Key Tronic Corporation and FAFB as PRPs.

In 1984, Ecology entered into a cooperative agreement with EPA to conduct a remedial investigation and feasibility study (RI/FS) at the Site. During that same year, bottled water was supplied to households with high contaminant concentrations in their water wells. In 1985, Spokane County extended the Whitworth Water District public water supply to those affected households. The RI was completed in 1987. It documented that the upper aquifer and lower aquifers were contaminated with solvents. The completed exposure pathways at the Site were ingestion of contaminated groundwater, ingestion of crops irrigated by or grown in contaminated groundwater, and dermal contact with groundwater via bathing. The RI evaluated potential exposures to surface water in the Little Spokane River and determined that human health risks for ingestion were minimal and there was no risk associated with dermal contact with the surface water. The RI also concluded that even if the groundwater plume reached and discharged to the Little Spokane River, the predicted concentrations would not pose a risk to human health.

The RI identified the following contaminants of concern (COC) in groundwater: 1,1,1-trichloroethane (TCA), 1,1-dichloroethylene (DCE), 1,1-dichloroethane (DCA), tetrachloroethylene (PCE), trichloroethylene (TCE) and methylene chloride.

Response Actions

Spokane County notified the residents of potential groundwater contamination in 1980. In 1984, homes potentially affected by groundwater contamination were supplied with bottled water and the County sampled residential wells on a voluntary basis. In 1985, the County provided the opportunity for residences relying on contaminated groundwater to connect to the Whitworth Water District's extended pressurized potable water line. Twenty-three homes connected to the new water line in 1985.

In September 1987, EPA issued an IROD for the Site. It identified the following objectives:

- Prevent further spread of contaminated groundwater in two aquifers by installing and operating interception wells.
- Remove contaminated materials that have entered the aquifers and are contributing to the contaminant plume by installing and operating extraction wells in the area where the plume originates.
- Reduce the toxicity, mobility and volume of the contaminants by treating all extracted groundwater from both interception and extraction wells.
- Provide an alternate water supply system to any residents deprived of their domestic supply due to demonstrated contamination from the landfill or due to the action of the extraction or interception systems.

The 1987 IROD specified that the remedy is designed to be the final remedial action at the Site. It was designated as an interim final action because the extraction and interception well systems will be in operation for decades before remediation is complete and changes in the selected action may be required during that period.

The selected interim remedy included the following primary components:

- Groundwater extraction and treatment.
- Providing an alternate water supply for affected residents.
- Institutional controls to ensure that the remedial action will continue to protect human health and the environment.

The landfill was closed in accordance with Washington state minimum functional standards (MFSs) for landfill closure in 1986. The closure will be addressed in the Site's final ROD (expected in 2029). Thus, this FYR does not address the landfill itself.

Groundwater performance standards for the six site COCs were established at the MCL, maximum acceptable concentration (MAC) or 1×10^{-6} cancer risk level (Table 1).

Table 1: Groundwater COCs Performance Standards

Groundwater COC	IROD Performance Standards (µg/L)	Basis
1,1,1-TCA	200	MCL
1,1-DCE	7	MCL
1,1-DCA	4,050	MAC
TCE	5.0	MCL
PCE	0.7	1×10^{-6} cancer risk
Methylene chloride	2.5	1×10^{-6} cancer risk
<i>Notes:</i> MAC = maximum acceptable concentration that should not be exceeded, calculated in the risk assessment. µg/L = micrograms per liter <i>Source:</i> The Site's 1987 IROD, Table 6.		

Status of Implementation

In 1989, EPA and Ecology entered into a Consent Decree with Spokane County and Key Tronic Corporation to implement the interim action. The Consent Decree established Key Tronic Corporation as having a financial responsibility while Spokane County was charged with being responsible for implementing the remedial action. In 1990, EPA and FAFB entered into an Administrative Order on Consent and Interagency Agreement. It directed FAFB to provide funding for the Colbert Landfill Special Fund Trust, in exchange for which EPA covenants not to sue the U.S. Air Force for specified CERCLA and Resource Conservation and Recovery Act (RCRA) liability concerning the Site.

Groundwater Extraction and Treatment

Spokane County completed construction of the Site's groundwater extraction and treatment system in 1997. The groundwater extraction and treatment system consists of both an upper aquifer and a lower

aquifer extraction system. The treatment system consists of an air stripper system to remove VOCs. The groundwater extraction and treatment system can treat up to 1,600 gallons per minute (gpm). Treated water is discharged to the Little Spokane River and effluent must meet the substantive requirements equivalent to those that would be contained in a conventional National Pollutant Discharge Elimination System (NPDES) permit. Various updates and changes to the systems have occurred and been presented in other site documents, including the Site's 2019 FYR Report. Appendix C provides an overview of the groundwater extraction system and operating history.

The groundwater extraction and treatment system ran from 1994 through March 2014. The upper aquifer system was shut down in 2004 because contaminant concentrations were below evaluation and adjustment control criteria, as defined in the 1999 O&M Plan for Colbert Landfill. The system was restarted briefly in 2006 due to an adjustment criteria exceedance and was shut down again in 2007, because all of the upper aquifer monitoring wells were below the IROD performance criteria. Occasional exceedances were observed for PCE, but PCE remains below the MCLs according to data reported in the 2018 optimization report (see description below). A shutdown test for the lower aquifer extraction and treatment system was deemed appropriate for the Site after a remedial system evaluation (RSE) was conducted in 2010.

The shutdown test began in 2014 and is expected to continue through 2026. Shutdown test procedures are outlined in the Site's 2013 Final Work Plan, Groundwater Pump & Treat System Shutdown Test (2013 Shutdown Plan). The 2013 Shutdown Plan specified that monitoring for the test would be needed for a minimum of 4.5 years and up to 9 years due to the groundwater velocities in the lower aquifer under non-pumping conditions. In 2023, 9 years after the shutdown, Ecology and EPA assessed groundwater data at the Site and determined that the shutdown test should continue until contaminant concentrations appear to stabilize, reach action levels, or until additional work is deemed necessary. Contaminant concentrations in the lower aquifer remain above the site performance standards. The current extent of groundwater contamination is described below and in the Data Review section of this FYR Report.

The 2013 Shutdown Plan describes the process for determining the point at which the groundwater extraction and treatment system will be either turned back on or other options assessed. The 2013 Shutdown Plan specified evaluation criteria, which mirror IROD performance standards, and action level criteria, which are set at 65% of the performance standards, to assess the need for system restart (Table 2).

Data collected from the extraction wells are not used to assess the need to restart the system. The lower aquifer wells designated as "compliance wells" are CD-41, CD-42, CD-43 and CD-49, and well clusters CD-44, CD-45, and CD-48. These wells were sampled quarterly for the first year and semi-annually during the second year, and they continue to be sampled annually as long as no significantly increasing COC trends are observed. The 2013 Shutdown Plan activities are ongoing. The monitoring wells are also used to evaluate the extent of groundwater contamination downgradient to the west.

Table 2: Shutdown Test Work Plan – Action Level and Evaluation Criteria

Groundwater COC	Action Level Criteria (µg/L) ^a	Evaluation Criteria (µg/L) ^b
1,1,1-TCA	130	200
1,1-DCE	4.55	7
1,1-DCA	2,632	4,050
TCE	3.25	5.0
PCE	0.5	0.7
Methylene chloride	1.6	2.5
<i>Notes:</i> a) Action level criteria are 65% of the IROD performance standards. b) Evaluation criteria are the same as the IROD performance standards. <i>Source:</i> The Site's 2013 Shutdown Plan.		

The groundwater data presented in the annual reports show that there have been no exceedances of any action level criteria during the shutdown of the system. However, a trend of increasing COC concentrations in wells downgradient of the landfill have become apparent over the previous three years (2021-2023). The Data Review section of this FYR Report provides more information about groundwater data collected during this FYR period.

In 2018, EPA led another optimization review of the site remedy. A key recommendation was to restart extraction well CP-W3 to capture contamination migrating past it to the west. The review also recommended restarting extraction well CP-E2. The review recommended improving plume delineation in the vicinity of CP-W3 by adding a monitoring well between the two existing downgradient wells. Ultimately, Spokane County chose to continue with the shutdown test and will continue to monitor groundwater in accordance with the 2013 Shutdown Plan.

The objective of the shutdown test is to determine if the extraction and treatment system is needed to prevent further degradation of the aquifer. Asymptotic conditions were reached in 1998, with continued extraction of mass reaching equilibrium with diffusion from remaining source material, either from the landfill or bound up in the aquifers. As the system was no longer resulting in decreasing concentrations, it was appropriate to determine if it continued to contribute to the restoration of the aquifer. The system ultimately serves 2 purposes at the Site, it provides hydraulic control of the COC plumes, and it extracts and treats contaminate mass. The upper aquifer appears to have generally met the performance criteria developed in the IROD. The lower aquifer and the basalt aquifer do not meet the performance criteria and the plumes associated with those aquifers appear to be expanding in some wells (see Data Review section of this FYR Report). It is unlikely that the extraction and treatment system will be able to restore groundwater to a beneficial reuse in a reasonable time frame.

Alternate Water Supply

Twelve more residences have been connected to the water supply since the IROD. Thirty-five homes that opted out of the water district line connections have their wells monitored periodically by the County to ensure health protectiveness.

Monitoring Programs

Spokane County has five ongoing monitoring programs directly associated with the remedy. These programs include the shutdown test, upper aquifer compliance, 1,4-dioxane sampling, supplemental

sampling and residential well monitoring programs (Table 3). Sampling under these programs ranges from quarterly to once every five years.

Table 3: Current Monitoring Programs

Program	Aquifer	Parameters	Frequency
Shutdown test	Lower	VOCs	Annually (extraction well quarterly)
Upper aquifer compliance	Upper	VOCs	Annually (extraction well quarterly)
1,4-Dioxane sampling	Lower/upper	1,4-Dioxane	Annually
Supplemental sampling	Upper	VOCs	Every five years
Residential well monitoring	Lower/upper	VOCs	Varies by well (monthly/quarterly/semi-annually/ annually/biannually)
<i>Notes:</i> <i>Source: Colbert Landfill Remedial Project Annual Report, 2023.</i>			

In 2005, EPA specified an additional constituent (1,4-dioxane) for evaluation at the Site. 1,4-Dioxane was detected at the Site above the Washington State Model Toxics Control Act (MTCA) criterion of 7 micrograms per liter (µg/L). There is no federal MCL for 1,4-dioxane. During the 2019 FYR, EPA recommended expanded sampling for 1,4-dioxane across a broader network of monitoring wells, including residential wells, for at least two sampling events to evaluate the presence and extent of 1,4-dioxane in post-shutdown conditions.

To evaluate the presence and extent of 1,4-dioxane in post-shutdown conditions, Spokane County applied for a remedial action grant through Ecology. 1,4-Dioxane sampling through the grant began in October 2021. From October 2021 to June 2023, 259 samples were collected across more than 95 wells and analyzed for 1,4-dioxane. The Data Review section of this FYR Report provides the results of the expanded sampling events.

Vapor Intrusion

The Site's 2009 FYR and 2010 RSE evaluated the potential for vapor intrusion at the Site. Both efforts concluded that the vapor intrusion pathway did not appear to be a concern.

Institutional Control (IC) Review

The IROD required institutional controls that are consistent with the final design to ensure that the remedial action will continue to protect human health and the environment. Institutional controls will be included in the final decision document.

In 2009, a restrictive covenant was filed for the landfill property. It restricts the drilling of wells or extraction of groundwater, for any use, except for the purpose of the cleanup action within the property, as required by the Consent Decree. It also restricts any activity that may impact the landfill cap or the integrity of the interim remedial action.

Installations of new wells are tracked by the Spokane County Health Department via permitting through Ecology consistent with Washington state regulations. If a well is to be placed within the vicinity of site contamination, the health district will notify the Spokane County Colbert Landfill personnel. If the well is adjacent to or within a known area of site contamination, homeowners are made aware of the possibility that the groundwater may be contaminated. Spokane County will request a sample from the well to be analyzed for COCs. If any COCs are detected, the use of the well will be discontinued. The homeowner is made aware of the available public water connection through the Whitworth Water District.

To ensure the continued protectiveness of residential water supply, Spokane County implements a residential monitoring program that provides an opportunity for all potentially affected well owners to have their individual wells tested at least biannually.

The County created an Institutional Control Implementation and Assurance Plan (ICIAP) in March 2021 to describe the process for recordable and enforceable controls, along with the key strategies to ensure the protection of public health and the environment in the area surrounding Colbert Landfill. The plan requires annual review of well records from Ecology. The records are reviewed to ensure no domestic use wells have been installed in the documented or anticipated areas of groundwater contamination from the landfill. In addition, Spokane County personnel perform regularly scheduled groundwater monitoring in monitoring wells installed around the site area as well as currently used domestic wells that were in operation before the cleanup site designation. This monitoring is used to evaluate any changes in COC concentrations that may adversely affect groundwater use.

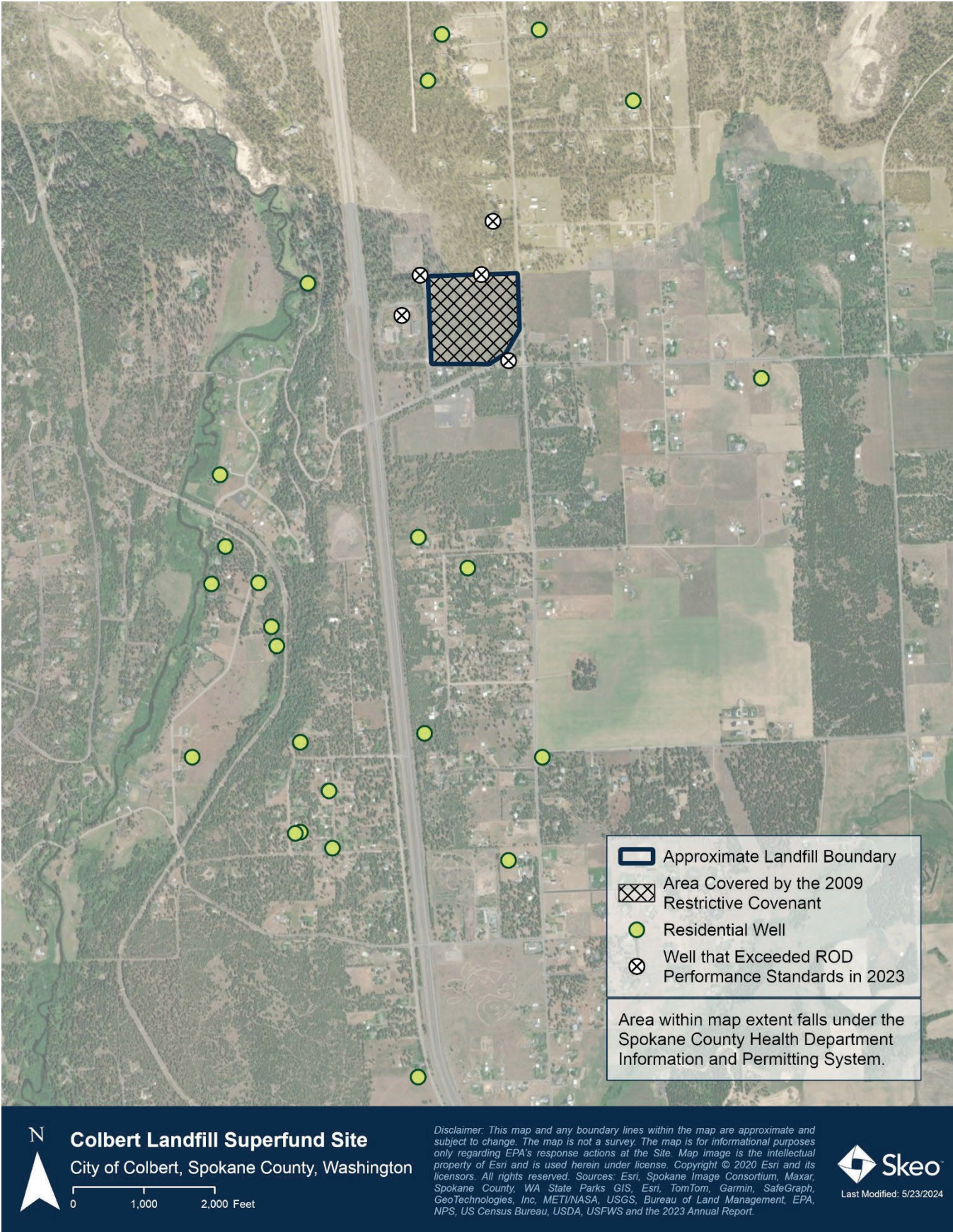
In accordance with the requirements of this plan, Spokane County used the 2023 plume maps and conducted a well search for that area. The County did not find any new domestic wells. All the domestic well locations were evaluated in relation to the upper and lower aquifer plume boundaries, and all the domestic wells were outside of the contamination plume areas of concern. The well reports that had “blank” well completion dates/well report received dates were also investigated and included wells with Well Report IDs 209225 through 209232, 209885, 209896, 209897, 209898, 209899, 294656 through 294669, 294712, and 294713. These wells are Spokane County-owned wells, wells in the Colbert Landfill residential monitoring program, or decommissioned wells.

Spokane County personnel sent the 2023 contamination plume maps to Ecology and the Spokane Regional Health District on June 30, 2023 and inquired about their findings regarding an evaluation for new well requests/well use changes in the Colbert Landfill vicinity. Ecology evaluated the wells in the area and consulted the well drilling coordinator and found no new domestic well requests. The Spokane Regional Health District also evaluated the wells in the area and found no recent well construction activities in the vicinity of Colbert Landfill. The institutional controls, shown in Figure 2, appear to be functioning as intended.

Table 4: Summary of Planned and/or Implemented Institutional Controls (ICs)

Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Groundwater	Yes	Yes	Parcels potentially impacted by site contamination	Prevent installation of wells in areas and at depths of known contamination.	County Information System
Landfill	Yes	Yes	Landfill property	Restricts the drilling of wells or extraction of groundwater, restricts any activity within the boundaries of the property that may result in the release of hazardous substances, and prohibits any activity that would threaten the structural integrity of the landfill cap or otherwise interfere with the cleanup action, operation and maintenance activities, or monitoring.	Restrictive covenant (2009)

Figure 2: Institutional Control Map



Systems Operations/Operation and Maintenance (O&M)

All O&M activities are conducted in accordance with the Site's 1999 O&M Plan. Many of the O&M activities are associated with the post-closure O&M of the landfill. These activities are not associated with the Site until required as part of the final ROD.

Additional O&M activities were conducted for the extraction wells. Extraction wells are inspected quarterly and cleaned as needed. During this FYR period, the County has not indicated any unusual or non-routine maintenance issues. The inspection and O&M activities are summarized in the annual reports. The treatment system has not operated continuously since 2014. The County runs the system quarterly when they sample the extraction wells as regular O&M to ensure it could be started up for continuous operation if required.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the previous FYR Report as well as the recommendations from the previous FYR Report and the status of those recommendations.

Table 5: Protectiveness Determinations/Statements from the 2019 FYR Report

OU #	Protectiveness Determination	Protectiveness Statement
1	Short-term Protective	The sitewide remedy currently protects human health and the environment because the domestic wells in the area of the Site are regularly sampled, most residences are connected to public water supply and water from individual wells is being monitored. In addition, Spokane County has established procedures to reduce potential exposure to groundwater contamination. However, for the remedy to be protective in the long-term, the following actions need to be taken: • Update and combine the monitoring plans at the Site to better reflect the current site conditions and extent of groundwater contamination at the Site. Ensure plan provides criteria for proper and timely action as necessary to prevent the plume from rebounding or extending beyond the current footprint and to address remaining contamination. • Sampling for 1,4-dioxane should be performed across a broader network of monitoring wells, including residential wells for at least two sampling events. Continue analyzing samples for 1,1-DCA, PCE and 1,4-dioxane; include analytes in updated monitoring plan and evaluate the data using current human health values. • Develop a scoping document evaluating the final ROD • Develop an ICIAP that provides for recordable and enforceable controls.

Table 6: Status of Recommendations from the 2019 FYR Report

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	Ongoing analysis of the Conceptual Site Model and RAOs lack reporting. A single monitoring plan providing overall monitoring objectives, sampling frequencies, analyses to be performed, and reporting requirements does not exist.	Update and combine the monitoring plans at the Site to better reflect current site conditions and the extent of groundwater contamination at the Site. Ensure the plan provides criteria for proper and timely action as necessary to prevent the plume from rebounding or extending beyond the current footprint and to address remaining contamination.	Ongoing	The County is considering updating and combining the monitoring plans.	Not applicable
1	1,4-Dioxane is sampled annually at select wells. These wells were selected prior to the system shutdown based on sampling events conducted in 2007 and 2008, and groundwater flow conditions and contaminant transport may have changed since the shutdown.	Sampling for 1,4-dioxane should be performed across a broader network of monitoring wells, including residential wells for at least two sampling events. Continue analyzing samples for 1,1-DCA, PCE and 1,4- dioxane; include analytes in an updated monitoring plan and evaluate the data using current human health values.	Ongoing	To evaluate the presence and extent of 1,4-dioxane in post-shutdown conditions, Spokane County applied for a remedial action grant through Ecology, and the 1,4-dioxane sampling through the grant began in October 2021. From October 2021 to June 2023, 259 1,4-dioxane samples were collected across more than 95 wells. The Data Review section of the FYR Report provides the results. Analysis continues for 1,1-DCA and PCE, and Spokane County is comparing the results to current human health values as appropriate. The monitoring plan updates are ongoing.	Not applicable
1	At the time of the IROD, 1,1-DCA was considered a noncarcinogenic compound. Since that time, it has been reclassified by EPA as a potential human carcinogen. In addition, the PCE performance goal is less than the current MCL. 1,4-Dioxane is not included in the [Interim] ROD but has been detected	Develop a scoping document evaluating the final ROD.	Addressed in Next FYR	EPA and Ecology will use the Superfund decision-making process to determine if additional remedial actions are needed at the Site. EPA and Ecology will use the results of the shutdown test as well as additional data to inform the scoping document. Final site cleanup levels will be established in the final ROD. Until that time, Spokane County will continue to compare contaminant concentrations to all relevant screening levels.	Not applicable

OU #	Issue	Recommendations	Current Status	Current Implementation Status Description	Completion Date (if applicable)
	in site wells above the MTCA cleanup goal of 7 µg/L.				
1	It is unclear if institutional control procedures are being used effectively as Spokane County does not track this process. Additionally, there is no institutional control plan in place for the Site, and it is unknown how effective the groundwater institutional controls are, given the county's informal information system.	Develop an ICIAP that provides for recordable and enforceable controls.	Completed	Spokane County created an ICIAP in March 2021.	3/1/2021

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Community Involvement and Site Interviews

A public notice was made available by newspaper posting in the Spokesman-Review, on July 1, 2024 (Appendix E). It stated that the FYR was underway and invited the public to submit any comments to EPA. The FYR Report will be made available on EPA's website at <https://www.epa.gov/superfund/colbert-landfill>.

EPA did not receive any public comments as a result of the public notice and no information was brought to EPA's attention during this FYR. Based on this lack of response, EPA did not conduct interviews. Ecology provided technical comments following an extensive review which are reflected in this FYR Report.

Data Review

Spokane County has five ongoing monitoring programs associated with the site remedy. These programs include the shutdown test, upper aquifer compliance, 1,4-dioxane sampling, supplemental sampling, and residential well monitoring programs (Table 3). The data collected as part of these programs are described below.

Overall, the data collected from the upper aquifer show groundwater concentrations have been below the IROD performance standards since 2019. As of 2024, the lower aquifer groundwater continues to exceed IROD performance standards for 1,1-DCE, PCE and TCE. These exceedances are in the area surrounding the landfill. There were no criteria exceedances in residential wells during this FYR period. The 1,4-dioxane sampling from 2024 shows only one monitoring well above the MTCA criteria of 7 µg/L

(CD-36A1, 8.66 µg/L in April 2024). The detected COC concentrations for both the lower and upper aquifers are included as Figures H-3 through H-12 in Appendix H.

Results from the 2022 supplemental sampling event show both increases and decreases in COC concentrations compared to concentrations from the supplemental sampling results in 2017. Data indicate that most of the COC concentration decreases occurred toward the outer edges of the plume, while COC concentration increases occurred closer to the center of the plume.

Shutdown Test – Lower Aquifer

The shutdown test is applicable to the lower aquifer only. Figure H-1 in Appendix H shows the sampled locations. The highest COC concentrations in the vicinity of Colbert Landfill are found in the lower aquifer. The overall distribution of the COC detections in 2024 are provided in Figures H-3 through H-7. After the shutdown of the Colbert Landfill lower aquifer extraction system, overall COC concentrations exhibited an initial increase followed by a decrease/plateau starting in 2017. This decrease/plateau ended in 2021-2022 and concentrations increased through late 2023. Data from 2024 appear to show a stabilization or slight decrease.

During this FYR period, the lower aquifer extraction wells (CP-W1, CP-W2, CP-W3, CP-E1, CP-E2 and CP-E3), the compliance monitoring well clusters (CD-41, CD-42, CD-43, CD-44, CD-45, and CD-48), and monitoring well CD-49 were sampled and analyzed for VOCs. There have been no exceedances of the IROD performance criteria, the evaluation criteria, or the action levels in the compliance wells. The extraction wells continue to exceed the IROD performance standards. While these wells are not used to evaluate the results of the shutdown test, they are part of the Site and are used to evaluate general compliance with the performance standards in the IROD.

All COC concentrations found in the lower aquifer extraction wells exhibited increases in concentrations between April 2022 and April 2023, however concentrations decreased in April 2024 with the exception of 1,1-DCA in CP-W3/CP-E2 and TCE for CP-E2 (Table 7). Further monitoring will determine if concentrations stabilize or continue to decrease.

Table 7: Lower Aquifer Shutdown Program Concentration Increases 2023 to 2024

Location	COC	IROD Performance Criteria	Evaluation Criteria	Action Level Criteria	2019 Results	2023 Results	2024 Results	Five-Year Difference	One-Year Difference
Compliance Wells									
CD-49	1,1,1-TCA	200	200	130	1.5	4.61	5.34	<i>3.84</i>	<i>0.73</i>
CD-49	1,1-DCE	7	7	4.55	1.57	3.99	4.03	<i>2.46</i>	<i>0.04</i>
Extraction Wells									
CP-E2	TCE	5	N/A	N/A	133	196	200	<i>67</i>	<i>4</i>
CP-W3	1,1-DCA	4,050	N/A	N/A	5.58	34.1	53.6	<i>48.02</i>	<i>19.5</i>
CP-W3	1,1-DCE	7	N/A	N/A	17.7	57.5	62.1	<i>44.4</i>	<i>4.6</i>
<i>Notes:</i> All results are shown in µg/L. Bold = exceeded IROD Performance criteria. <i>Italic</i> = increase in analyte concentration. N/A = action level criteria not applicable to extraction wells. <i>Source:</i> Adapted from Table 2-8 in the 2024 Annual Report.									

There have been no COC action level or IROD performance standard exceedances in any of the lower aquifer compliance monitoring wells, however there are performance standard exceedances in the lower aquifer extraction wells (Table 7).

1,1-DCE concentrations at CD-49 increased from 3.99 µg/L in April 2023 to 4.45 µg/L in January 2024, and then decreased to 4.03 µg/L in April 2024 (action level is 4.55 µg/L). Table 7 lists individual COC concentration increases for all compliance and extraction wells between April 2023 and April 2024. Charts H-1 through H-6 in Appendix H show the change in concentration over time for the lower aquifer extraction and compliance wells. Methylene chloride is generally not detected in the lower aquifer. During this FYR period, there was a single exceedance of the methylene chloride performance standard (2.5 µg/L) in well CD-21C3, located in the landfill area (result of 2.92 µg/L in 2022).

According to 2013 Shutdown Plan, if analyte concentrations exceed the action level for four consecutive quarters, a restart of the extraction and treatment system may occur if deemed necessary after further evaluation of all COC concentrations/groundwater flow data in the lower aquifer. Monitoring wells CD-49 and CD-43C1 were kept on a quarterly sampling schedule to better evaluate the increasing trends in 1,1,1-TCA and 1,1-DCE concentrations. County personnel will continue to add more wells to the quarterly/annual sampling programs (if necessary) to better evaluate the current increasing trends observed in source areas, source-area downgradient wells and compliance monitoring wells.

Upper Aquifer Compliance Monitoring

The compliance monitoring program is outlined in the Consent Decree and performed in accordance with the Site's 1998 O&M Plan. The designated compliance wells include CD-31A1, CD-34A1, CD-36A1, CD-37A1, CD-38A1, CD-40C1, CP-S1, CP-S3, CP-S4, CP-S5 and CP-S6. Spokane County uses two sets of criteria to determine compliance in their annual monitoring reports. The first set is the IROD performance criteria. The second set is the updated criteria values identified in the Site's sixth FYR Report, which includes an increase for PCE from the performance standard in the IROD (0.7 µg/L) to the current MCL (5 µg/L), and a decrease for 1,1-DCA to the regional screening level (RSL) of 2.8 µg/L.¹ Figure H-2 shows the upper aquifer compliance monitoring locations. There were no exceedances of the IROD performance criteria in the upper aquifer. There were exceedances of the 1,1-DCA RSL (highest concentration of 13.9 in upper aquifer compliance well CD-36A1). Figure H-8 through H-12 show the COC detection extent from 2024.

COC concentrations in the upper aquifer compliance wells have exhibited stable/decreasing trends following the shutdown of the extraction wells. Like several monitoring wells in the lower aquifer, COC concentrations exhibited an initial increase after the shutdown of the extraction system. Concentrations increased between 2022 and 2023 but appear to have stabilized in 2024. Continued monitoring will determine if the stable/decreasing trend continues. Methylene chloride has not been detected in the upper aquifer during this FYR period (reporting limit of 0.5 µg/L to 1 µg/L).

Residential Well Monitoring

Spokane County monitors 29 residential wells through the Residential Well Monitoring Program. Criteria for residential-use wells were established in the Consent Decree. The Consent Decree states

¹ The EPA RSL for DCA is 2.8 µg/L, however Spokane County uses 2.6 µg/L in their Annual Reports. It is assumed this is a typographical error.

that if any residential well with a concentration over the evaluation criteria or any residential well that has an average concentration over 65% of the evaluation criteria over 12 months, the County shall supply that residence with an alternative source of water.

There were no criteria exceedances during this FYR period. The only COC concentrations above the reporting limit during this FYR period were low. 1,1-DCA was reported at concentrations ranging from 0.52 µg/L to 0.95 µg/L in one residential well. The 1,1-DCA RSL is 2.8 µg/L.

1,4-Dioxane Monitoring

During this FYR period, 1,4-dioxane was detected in the lower aquifer in all the extraction wells, along with one residential well. The overall highest concentrations were observed in May 2022 at CD-04C1 and CD-04E1 at 616 µg/L and 99.4 µg/L, respectively. These wells are located in the landfill area and are supplemental wells that were only sampled in May 2022. From September 2022 through June 2023, the highest concentrations in the lower aquifer were observed well CP-W3 at 2.54 µg/L. 1,4-Dioxane concentrations in this extraction well increased in April 2024 to 44.4 µg/L and then to 65.9 µg/L in May 2024. The 1,4-dioxane concentration detected in one residential well was 0.217 µg/L in February 2023.

For the upper aquifer, 1,4-dioxane concentrations were detected in several residential wells, compliance monitoring wells and extraction wells. CD-36A1 has consistently exhibited the highest concentrations of 1,4-dioxane in the upper aquifer since 1,4-dioxane evaluation sampling began in 2021 (2024 results were 8.66 µg/L). The highest 1,4-dioxane concentration in residential wells sampled in 2022 and 2023 was 0.462 µg/L, well below the MTCA standard.

The 1,4-dioxane concentrations in the lower aquifer and upper aquifer are shown in Charts H-7 and H-8, respectively.

Supplemental Sampling

Every five years, supplemental wells are sampled during the annual sampling event to gather more information and data on groundwater movement and contaminant transport around Colbert Landfill. In total, 46 wells were sampled during the May 2022 supplemental sampling event (Figure H-13). Results for the 2022 supplemental sampling event indicate that there have been both increases and decreases in COC concentrations compared to concentrations observed from the supplemental sampling results in 2017. Supplemental wells CD-01C1 and CD-26 have exhibited decreases in 1,1,1-TCA and 1,1-DCE concentrations. Supplemental well CD-04E1 exhibited decreases in 1,1,1-TCA concentrations, but 1,1-DCE concentrations have increased from observed concentrations collected in 2012. CD-24C2, CD-02RC2 and CD-07E1 mainly exhibited increases in COC concentrations from the observed concentrations collected in 2017. Data indicate (with exceptions) that most of the COC concentration decreases occurred toward the outer edges of the plume, while COC concentration increases occurred closer to the center of the plume.

The additional data obtained from the supplemental sampling during May 2022 indicated the highest concentrations for both 1,1,1-TCA and 1,1-DCE were in CD-21C3. Prior to the May 2022 supplemental sampling, county personnel observed that the highest concentrations for 1,1,1-TCA and 1,1-DCE were in CP-E2 and CD-04E1, respectively. Spokane County has not sampled CD-21C3 since 1995.

Site Inspection

The site inspection took place on April 30, 2024. Participants included EPA RPM Ravi Sanga; Kristin Beck, from Ecology; Austin Stewart, Lindsay Chapman, Robert Lindsay, Mike Terris, Craig Campbell and Deb Geiger from Spokane County; and EPA's contractor. The purpose of the inspection was to assess the protectiveness of the remedy. The inspection checklist and photos are provided in Appendix F and G, respectively.

Site inspection participants met at the Spokane County facility located on the landfill property. The landfill property is surrounded by a gated fence area with two entrances, both of which have signage and are secured. Inside the County office, Spokane County staff shared information on the site activities during this FYR period. Following the presentation, site inspection participants observed the groundwater extraction and treatment system. The extraction and treatment system, which is in standby mode, was well maintained. The landfill cover is well vegetated and maintained. Site inspection participants observed some of the extraction wells, located both inside and outside the landfill property boundary, which were labeled and locked.

V. TECHNICAL ASSESSMENT

QUESTION A: Is the remedy functioning as intended by the decision documents?

Question A Summary:

Yes, the remedy is generally functioning as intended by the IROD, however a final ROD is needed to address the full extent of groundwater contamination at the Site. A groundwater extraction and treatment system was constructed in 1994. The system was designed to withdraw contaminated groundwater and treat and discharge it to the Little Spokane River. The system targeted the upper and lower aquifer. The upper aquifer extraction has been in standby mode since 2007, when extraction was stopped due to most wells being below IROD performance standards. As of 2019, all upper aquifer wells were below IROD performance standards. In addition to the IROD performance standards, Spokane County also compares groundwater results to the Consent Decree evaluation criteria, updated criteria for PCE and 1,1-DCA, and the MTCA criteria for 1,4-dioxane. As of 2024, one upper aquifer well, CD-36A1, is above the 1,4-dioxane MTCA criteria and the 1,1-DCA RSL. The lower aquifer extraction system was placed in standby mode after the 2014 initiation of the shutdown test to evaluate whether the interim remedy was still contributing to achieving site RAOs. Wells are sampled and the data are evaluated annually. COC concentrations in the upper and lower aquifer increased between 2021 and 2023 but appear to have stabilized or decreased in 2024. As approved by EPA and Ecology, Spokane County is extending the shutdown test to determine if more time is needed for the system to equilibrate. There have been no COC criteria exceedances in any of the lower aquifer compliance monitoring wells, however the lower aquifer extraction wells continue to exceed performance standards. 1,1-DCE concentrations at CD-49 are approaching the action level of 4.55 µg/L (2024 concentration of 4.05 µg/L). Significant contamination remains in the lower aquifer and there is currently no active remediation to address this contamination. EPA and Ecology will use the Superfund decision-making process to determine the next steps for the Site.

Spokane County conducted 1,4-dioxane monitoring from October 2021 to June 2023. During that time, 259 1,4-dioxane samples were collected across more than 95 wells. Additional sampling was conducted

in April 2024 at select wells, which will continue to be conducted annually. 1,4-Dioxane was detected in both the upper and lower aquifers. The highest concentrations are located in the vicinity of the landfill in the lower aquifer. In the upper aquifer, one well exceeded the MTCA standard of 7 µg/L (CD-36A1 at 8.8 µg/L in 2024). Spokane County plans to use this data to determine the extent and distribution in post-shutdown conditions, update the sampling plan and assist in predicting any possible migration of the contaminant toward human and environmental receptors. The results of the 1,4-dioxane monitoring should be summarized in a report.

Most homes are connected to the extended public water system. The remaining residential wells are tested periodically and remain below performance standards. The interim remedy is functioning as intended.

Institutional controls are in place and maintained by the County to prevent unauthorized wells in areas of contamination or use of existing wells without adequate testing. The 2021 ICIAP is in place. Spokane County is successfully implementing and monitoring the institutional controls.

QUESTION B: Are the exposure assumptions, toxicity data, cleanup levels and RAOs used at the time of the remedy selection still valid?

Question B Summary:

Except for 1,1-DCA, PCE, methylene chloride and 1,4-dioxane, the exposure assumptions, cleanup levels and RAOs used at the time of the remedy are still valid. The groundwater performance standards as based on MCLs have not changed, except for PCE and methylene chloride. The PCE performance standard in the IROD (0.7 µg/L) is lower than the current MCL (5 µg/L), as the IROD performance standard was based on the 1×10^{-6} cancer risk screening. Spokane County uses the current PCE MCL in its annual reports. The groundwater performance standard for methylene chloride was also risk-based in the IROD. There is now an MCL which is lower than the IROD performance standard (0.5 µg/L versus 2.5 µg/L) (Appendix I, Table I-1). The groundwater performance standard for methylene chloride was also risk-based in the IROD. The cleanup goals for PCE and methylene chloride remain below EPA's acceptable risk range for cancer and less than the hazard quotient (HQ) for non-cancer risk. The cleanup goal for 1,1-DCA exceeds EPA's acceptable risk range of 1.0×10^{-6} to 1.0×10^{-4} (Table J-1). This change was noted in the 2019 FYR Report. Spokane County compares 1,1-DCA data to the current RSL, however there appears to be a typographical error which has the RSL as 2.6 µg/L versus 2.8 µg/L. This should be corrected in future reports. Final Site cleanup levels will be established in the final ROD. Until that time, Spokane County will continue to compare contaminant concentrations to all relevant screening levels.

1,4-Dioxane does not have an IROD performance standard. Spokane County compares the 1,4-dioxane data to the MTCA standard of 7 µg/L. There is no federal MCL for 1,4-dioxane. The MTCA standard falls within EPA's acceptable cancer risk management range of 0.46 to 46 µg/L. As part of the final ROD for the Site, MTCA standards will be evaluated as ARARs.

RAOs at the Site include prevention of the further spread of contaminated groundwater, removal of contaminated materials and provision of an alternate water supply to homes affected by site contamination. These objectives remain valid. Contamination persists mostly in the lower aquifer.

Vapor intrusion was not considered an exposure pathway in the IROD. The Site's 2009 FYR and 2010 RSE evaluated the potential for vapor intrusion at the Site. Both efforts concluded that the vapor intrusion pathway did not appear to be a concern.

The Colbert Landfill received waste from FAFB that were subsequently labeled as hazardous. In addition, groundwater near the FAFB has been found to contain per- and polyfluoroalkyl substances (PFAS), likely associated with the use of aqueous film forming foam containing PFAS. The 2019 FYR Report indicated that disposal of PFAS was possible but not likely based on an EPA review of the historical records. EPA recently promulgated federal drinking water standards for several individual PFAS. Despite the detailed records for the landfill, perfluorooctanoic acid (PFOA) is widely used and a potential COC at many landfills. Given the potential risk to well owners, additional evaluation for PFAS should be considered.

QUESTION C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

VI. ISSUES/RECOMMENDATIONS

Issues/Recommendations	
OU(s) without Issues/Recommendations Identified in the FYR:	
None	

Issues and Recommendations Identified in the FYR:
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OU(s): 1	Issue Category: Remedy Performance			
	Issue: The shutdown test for the lower aquifer extraction and treatment system has been ongoing since 2014. The most recent monitoring results show an increase in contaminant concentration.			
	Recommendation: Continue to evaluate the results of the shutdown test and determine the next steps.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	PRP	EPA	10/1/2026

OU(s): 1	Issue Category: Monitoring			
	Issue: 1,4-Dioxane has been detected at the Site but does not have an IROD performance standard. Spokane County compares the 1,4-dioxane data to the MTCA standard of 7 µg/L. There is no federal MCL for 1,4-			

	dioxane. The MTCA standard falls within EPA's acceptable cancer risk management range of 0.46 to 46 µg/L.			
	Recommendation: Determine if 1,4-dioxane should be added as a site COC, determine the appropriate performance standards and incorporate into the final remedy for the Site.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	EPA	EPA/State	10/1/2026

OU(s): 1	Issue Category: Monitoring			
	Issue: The Colbert Landfill received wastes from FAFB that were subsequently labeled as hazardous. In addition, groundwater near the FAFB has been found to contain PFAS. The 2019 FYR Report indicated that disposal of PFAS was possible but not likely based on preliminary EPA review of the historical records. EPA recently promulgated federal drinking water standards for several individual PFAS.			
	Recommendation: Start sampling for PFAS.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	EPA	EPA/State	10/1/2026

OU(s): 1	Issue Category: Remedy Performance			
	Issue: The 1987 ROD was an interim ROD. Groundwater data indicates contamination is present in the Lower Aquifer and potentially migrating. It is unlikely that the extraction and treatment system will be able to restore groundwater to a beneficial reuse in a reasonable time frame.			
	Recommendation: Use the Superfund decision-making process to select a final remedy for the Site.			
Affect Current Protectiveness	Affect Future Protectiveness	Party Responsible	Oversight Party	Milestone Date
No	Yes	EPA	EPA/State	1/31/2029

OTHER FINDINGS

Two additional recommendations were identified during the FYR. These recommendations do not affect current and/or future protectiveness.

- Update the monitoring plans to incorporate 1,4-dioxane and consider updating and consolidating the plans, as appropriate. Additionally, the monitoring plans should include an increase for PCE from the performance standard in the IROD (0.7 µg/L) to the current MCL (5 µg/L), and a decrease for 1,1-DCA to the regional screening level (RSL) of 2.8 µg/L.
- Spokane County compares 1,1-DCA data to the current RSL, however there appears to be a typographical error which has the RSL as 2.6 µg/L instead of 2.8 µg/L. This should be corrected in future reports.

VII. PROTECTIVENESS STATEMENT

Sitewide Protectiveness Statement
<i>Protectiveness Determination:</i> Short-term Protective
<i>Protectiveness Statement:</i> The sitewide remedy currently protects human health and the environment because the domestic wells in the area of the Site are regularly sampled, most residences are connected to public water supply and water from individual wells is being monitored. In addition, Spokane County has established procedures to reduce potential exposure to groundwater contamination. However, for the remedy to be protective in the long-term, the following actions need to be taken: • Continue to evaluate the results of the shutdown test and determine the next steps. • Determine if 1,4-dioxane should be added as a site COC, determine the appropriate performance standards and incorporate into the final remedy for the Site. • Start sampling for PFAS. Use the Superfund decision-making process to select a final remedy for the Site.

VIII. NEXT REVIEW

The next FYR Report for the Colbert Landfill Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Colbert Landfill Remediation Project Annual Report 2019, Progress Report for May 2018 through April 2019. Prepared by Spokane County Landfill Closure. 2019.

Colbert Landfill Remediation Project Annual Report 2020, Progress Report for May 2019 through June 2020. Prepared by Spokane County Landfill Closure. 2020.

Colbert Landfill Remediation Project Annual Report 2021, Progress Report for May 2020 through June 2021. Prepared by Spokane County Landfill Closure. 2021.

Colbert Landfill Remediation Project Annual Report 2022, Progress Report for May 2021 through June 2022. Prepared by Spokane County Landfill Closure. October 31, 2022.

Colbert Landfill Remediation Project Annual Report 2023, Progress Report for May 2022 through June 2023. Prepared by Spokane County Landfill Closure. 2023.

Colbert Landfill Remediation Project Annual Report 2024, Progress Report for April 2023 through June 2024. Prepared by Spokane County Landfill Closure. 2024.

Consent Decree No. C-89-033-RJM. United States District Court, Eastern District of Washington. January 9, 1989.

Fact Sheet for Landfill Reuse and Redevelopment, Colbert Landfill Superfund Site, Colbert, Washington. Spokane County.

Fifth Five-Year Review Report, Colbert Landfill Superfund Site, Colbert, Washington. Prepared by the United States Army Corps of Engineers, Seattle District for the EPA Region 10. September 29, 2014.

Final Remediation System Evaluation, Colbert Landfill Superfund Site, Colbert, Washington. Spokane County, Washington. October 14, 2010.

Final Work Plan – Groundwater Pump & Treat System, Shutdown Test, Colbert Landfill Superfund Site, Colbert, Washington. Prepared by Spokane County Public Utilities. August 28, 2013.

ICIAP for Colbert Landfill. Prepared by Landfill Closure Section, Spokane County Environmental Services Department. March 2021.

Operations and Maintenance Manual for Colbert Landfill Closure, Colbert Landfill Superfund Site, Colbert, Washington. Prepared by CH2MHill for Spokane County Utilities. May 1997.

Operations and Maintenance Plan, Colbert Landfill Superfund Site, Colbert, Washington. Prepared by Landau Associates, Inc. for Spokane County. December 15, 1999.

Optimization Recommendation Comments, Colbert Landfill Superfund Site, Colbert, Washington. Prepared by Spokane County, Washington. April 5, 2018.

Optimization Review Report, Operation and Maintenance Optimization Study, Colbert Landfill Superfund Site, Colbert, Washington. EPA Region 10. January 2018.

Phase II Remedial Design/Remedial Action, Final Groundwater Monitoring Plan, Colbert Landfill Superfund Site, Colbert, Washington. Prepared by Landau Associates, Inc. for Spokane County, Washington. August 7, 1992.

Phase II Remedial Design/Remedial Action, Quality Assurance Project Plan, Colbert Landfill Superfund Site, Colbert, Washington. Prepared by Landau Associates, Inc. for Spokane County, Washington. February 28, 1992.

Proposed Groundwater Monitoring Plan, Colbert Landfill Superfund Site, Colbert, Washington. Prepared by Spokane County, Washington. March 13, 1996.

Quality Assurance and Field Sampling Plan, Colbert Landfill Superfund Site, Colbert, Washington. Spokane County Utilities. October 1990.

Record of Decision, Colbert Landfill Superfund Site, Colbert, Washington. EPA Region 10. September 29, 1987.

Response Comments to Fifth Five-Year Review Report, Colbert Landfill Superfund Site, Colbert, Washington. Spokane County, Washington. July 30, 2014.

Reuse Assessment, Colbert Landfill Superfund Site, Colbert, Washington. EPA Region 10. November 2018.

Sixth Five-Year Review Report for Colbert Landfill Superfund Site, Spokane County, Washington. EPA Region 10. September 2019.

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
EPA, Ecology and Spokane County sampled nearby domestic wells after resident complaints	April 24, 1980
EPA listed the Site on the NPL	1983
Spokane County extended the public water supply main to affected households	1985
Ecology completed the RI/FS	September 29, 1987
EPA issued the IROD	September 29, 1987
Spokane County started remedial action construction	August 28, 1989
Spokane County completed the remedial design for the groundwater treatment system	July 12, 1993
EPA issued the Site's first FYR Report	July 13, 1994
Spokane County started landfill closure activities	August 15, 1996
Groundwater treatment system construction completed	February 13, 1997
Spokane County completed landfill closure	May 31, 1997
EPA issued the Site's Construction Close-Out Report	September 9, 1997
Spokane County placed south system extraction wells CP-S1, CP-S5 and CP-S6 on standby	April 30, 1998
EPA issued the Site's second FYR Report	September 20, 1999
Spokane County placed south system extraction well CP-S4 on standby	June 2, 2004
EPA issued the Site's third FYR Report	September 30, 2004
Spokane County placed west system extraction well CP-W1 on standby	January 26, 2005
Spokane County stopped extraction from the upper aquifer extraction system	2007
EPA issued the Site's fourth FYR Report	September 30, 2009
EPA and Ecology filed a restrictive covenant with Spokane County	2009
EPA completed an RSE	April 13, 2010
Spokane County completed the groundwater extraction and treatment system shutdown test final work plan	August 28, 2013
EPA issued the Site's fifth FYR Report	September 29, 2014
Spokane County initiated the shutdown test	March 2014
EPA completed the Site's Optimization Review Report	January 23, 2018
EPA issued the Site's sixth FYR Report	September 26, 2019

APPENDIX C – OVERVIEW OF GROUNDWATER EXTRACTION AND TREATMENT SYSTEM

Groundwater Extraction System

The groundwater extraction and treatment system consists of the following components:

- Upper Aquifer System
 - About 1 mile south of the landfill, a line of interception wells was placed with the intent to prevent the southern expansion of the contaminant plume in the upper aquifer only.
 - Four extraction wells – CP-S1, CP-S4, CP-S5, CP-S6 (southern system).
 - The system initially shut down in 2004 due to contaminant concentrations below evaluation and adjustment control criteria, as defined in the 1999 O&M Plan for Colbert Landfill. The system restarted briefly in 2006 and was shut down again in 2007.

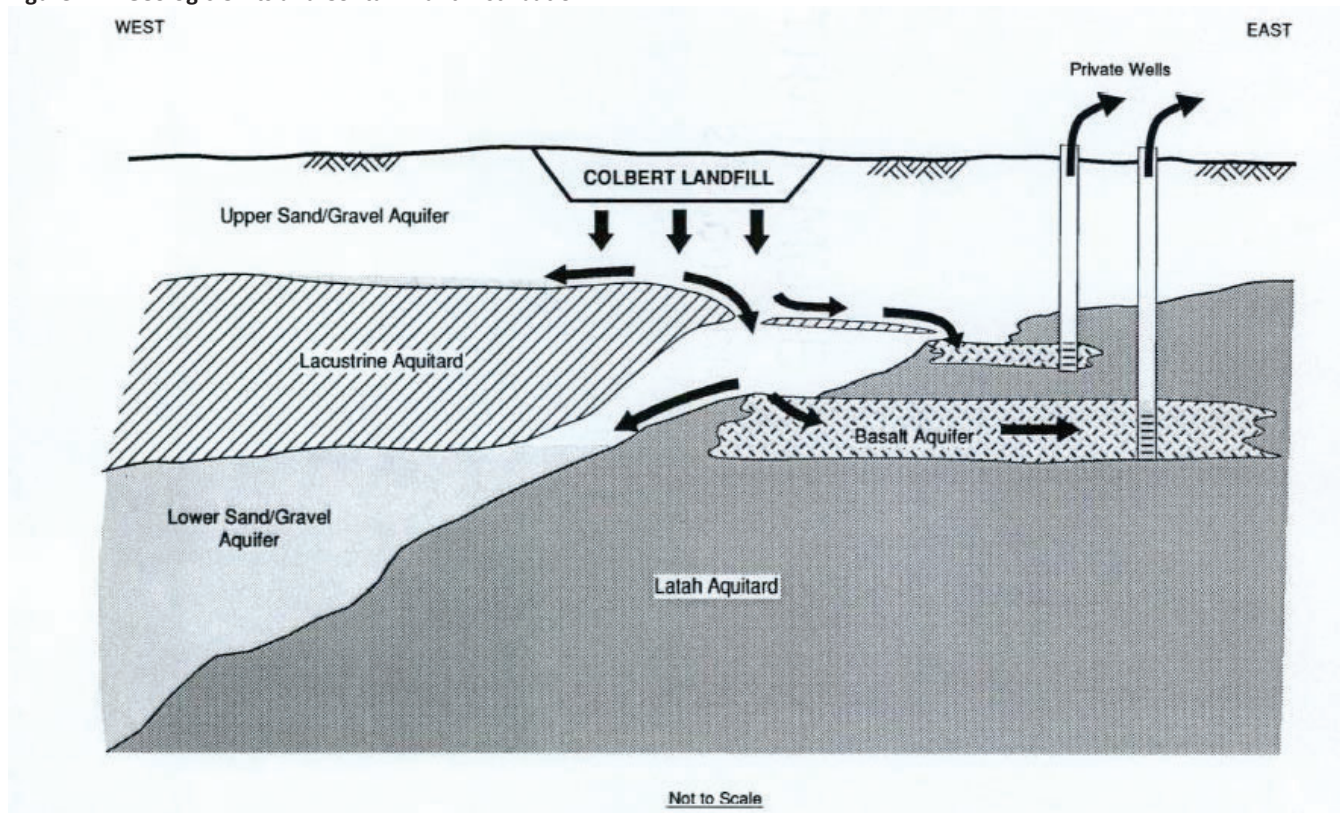
The system has remained shut down, as contaminant concentrations remain below adjustment criteria and the plume shows no indication of expansion.
 - Post-attainment compliance monitoring is ongoing at wells CD-31A1, CD-36A1, CD-37A1, CD-38A1, CP-S3 and CD-34A1.
- Lower Aquifer System
 - The west system consists of three extraction wells – CP-W1, CP-W2 and CP-W3 – screened in the lower aquifer.
 - Designed to lower contaminant concentrations and prevent further westward migration of the contaminant plume.
 - System pumping capacity is 400 gpm to 450 gpm.
 - Compliance monitoring wells associated with this extraction system include CD-41(C1/2/3), CD-42(C1/2/3), CD-48(C1/2/3), CD-43(C1/2/3), CD-44(C1/2/3), CD-45(C1/2/3) and CD-48(C1/2/3).
 - The east system has three extraction wells – CP-E1, CP-E2 and CP-E3 – screened in the lower aquifer.
 - CP-E1 and CP-E3 provide a combined capacity of 225 gpm to 250 gpm, while CP-E23 delivers a capacity of 0.5 gpm to 2 gpm due to its screening in the basalt aquifer.
 - The system was installed for the sole purpose of reducing concentrations of contaminants/source control.
- There are no compliance monitoring wells established for the eastern extraction system. Based on the groundwater potentiometric surface map for the lower aquifer, groundwater in this area flows west with the exception of the area around CD-23C2. The plume maps show COC migration to the east of the eastern extraction system indicating some groundwater is moving to the east of the eastern extraction system. Treatment System
 - An air stripping system designed to remove VOCs from the extracted groundwater.
 - The system may treat as much as 1,600 gpm of extracted groundwater. Prior to shutdown, it had treated about 650 gpm of extracted groundwater.
 - Treated groundwater is discharged via gravity to the Little Spokane River through an underground 12-inch-diameter PVC pipeline.

In 2007, the upper aquifer southern extraction system was shut down. These upper aquifer system wells continue to be in standby mode, as COC concentrations remain well below IROD performance standards.

The RSE also evaluated the lower aquifer system (east and west) extraction systems in greater depth. In the east system, the RSE noted that the decline of COC concentrations was substantial from the start of extraction until 1998. However, concentrations in the east wells had remained stable since 1998. The west extraction system well CP-W1 attained low concentrations and was shut down by 2005. Wells CP-W2 and CP-W3 had relatively low concentrations compared to the performance standards, and these decreases occurred primarily up to 1998. Based on supplemental data from the fourth FYR, the RSE concluded the shape and size of the plume had not changed significantly since the extraction system started running. These data observations led the RSE team to theorize that the current extraction system may not be adding to the overall protectiveness of the remedy. The RSE team indicated that a shutdown test may be appropriate to determine if terminating extraction has a negative impact on water quality. The shutdown test began in 2014 and is ongoing.

APPENDIX D – SITE MAPS

Figure D-1: Geologic Units and Contaminant Distribution²



² Source: The Site's 2018 Optimization Review Report.

APPENDIX E – PRESS NOTICE

CLEANUP TO BE REVIEWED FOR COLBERT LANDFILL SUPERFUND SITE (COLBERT, WA)

Cleanup to be reviewed for Colbert Landfill Superfund Site (Colbert, WA) Colbert Landfill is located in two miles north of Colbert, Washington. Colbert Landfill was listed as a Superfund Site (a highly contaminated toxic waste site) by the U.S. Environmental Protection Agency in 1983 after discovering that prior waste disposal at the landfill seriously contaminated soil and groundwater with volatile organic compounds. The EPA's cleanup (or remedy) is complete, but long-term groundwater monitoring is ongoing. The EPA is working on the seventh Five-Year Review for the Colbert Landfill Superfund Site (due in September 2024). A Five-Year Review provides a routine check-up to make sure that the cleanup continues to protect people and the environment. The most recent Five-Year Review (from 2019) showed that the Colbert Landfill Superfund Site cleanup remains protective of human health and the environment. To ensure the cleanup continues to be protective of human health and the environment, the EPA performs this comprehensive review every five years. Do you have information on how the cleanup is working? Have you witnessed any damage to the signage or fencing? Do you have other information? If so, the EPA wants to hear from you by July 12, 2024. Please contact: · Ravi Sanga, EPA Remedial Project Manager at sanga.ravi@epa.gov or 206-553-4092 If you have concerns about well water quality, please contact: Austin Stewart, Spokane County, ASTEWART@spokanecounty.org For more information about the Colbert Landfill Superfund Site, please visit: · EPA's website: www.epa.gov/superfund/colbert-landfill · The Spokane Public Library at 906 West Main Avenue, Spokane WA 99201 If you need materials in an alternative format or language, please contact EPA Community Involvement Coordinator Laura Knudsen at knudsen.aura@epa.gov or 206-643-4299.



APPENDIX F – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST			
I. SITE INFORMATION			
Site Name: Colbert Landfill		Date of Inspection: <u>4/30/2024</u>	
Location and Region: Colbert, WA 10		EPA ID: WAD980514541	
Agency, Office or Company Leading the Five-Year Review: <u>EPA</u>		Weather/Temperature: <u>50s, sunny</u>	
Remedy Includes: (check all that apply) ☐ Landfill cover/containment ☐ Access controls ☒ Institutional controls ☒ Groundwater pump and treatment ☐ Surface water collection and treatment ☒ Other: <u>Alternate water supply</u> ☐ Monitored natural attenuation ☐ Groundwater containment ☐ Vertical barrier walls			
Attachments: ☐ Inspection team roster attached ☐ Site map attached			
II. INTERVIEWS (check all that apply)			
1. O&M Site Manager Name _____ Title _____ Date _____ Interviewed ☐ at site ☐ at office ☐ by phone : _____ Problems, suggestions ☐ Report attached: _____			
2. O&M Staff Name _____ Title _____ Date _____ Interviewed ☐ at site ☐ at office ☐ by phone : _____ Problems/suggestions ☐ Report attached: _____			
3. Local Regulatory Authorities and Response Agencies (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply. Agency _____ Contact _____ Name _____ Title _____ Date _____ Phone No. _____ Problems/suggestions ☐ Report attached: _____ Agency _____ Contact _____ Name _____ Title _____ Date _____ Phone No. _____ Problems/suggestions ☐ Report attached: _____ Agency _____ Contact _____ Name _____ Title _____ Date _____ Phone No. _____ Problems/suggestions ☐ Report attached: _____ Agency _____			

Contact	_____	_____	_____	_____
	Name	Title	Date	Phone No.
Problems/suggestions	☐ Report attached: _____			
Agency	_____			
Contact	_____	_____	_____	_____
	Name	Title	Date	Phone No.
Problems/suggestions	☐ Report attached: _____			
4. Other Interviews (optional) ☐ Report attached: _____				
III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)				
1.	O&M Documents			
	☒ O&M manual	☒ Readily available	☒ Up to date	☐ N/A
	☒ As-built drawings	☒ Readily available	☒ Up to date	☐ N/A
	☒ Maintenance logs	☒ Readily available	☒ Up to date	☐ N/A
	Remarks: _____			
2.	Site-Specific Health and Safety Plan		☒ Readily available	☒ Up to date ☐ N/A
	☒ Contingency plan/emergency response plan	☒ Readily available	☒ Up to date	☐ N/A
	Remarks: _____			
3.	O&M and OSHA Training Records		☒ Readily available	☒ Up to date ☐ N/A
	Remarks: _____			
4.	Permits and Service Agreements			
	☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
	☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
	☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
	☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A
	Remarks: <u>Effluent was discharged under substantive discharge monitoring requirements.</u>			
5.	Gas Generation Records		☒ Readily available	☒ Up to date ☐ N/A
	Remarks: _____			
6.	Settlement Monument Records		☒ Readily available	☒ Up to date ☐ N/A
	Remarks: _____			
7.	Groundwater Monitoring Records		☒ Readily available	☒ Up to date ☐ N/A
	Remarks: _____			
8.	Leachate Extraction Records		☐ Readily available	☐ Up to date ☒ N/A
	Remarks: _____			
9.	Discharge Compliance Records			

☐ Air ☒ Water (effluent) Remarks: _____	☐ Readily available ☒ Readily available	☐ Up to date ☒ Up to date	☒ N/A ☐ N/A																																								
10. Daily Access/Security Logs ☒ Readily available ☒ Up to date ☐ N/A Remarks: _____																																											
IV. O&M COSTS																																											
1. O&M Organization ☐ State in-house ☒ PRP in-house ☐ Federal facility in-house ☐ _____ ☐ Contractor for state ☐ Contractor for PRP ☐ Contractor for Federal facility																																											
2. O&M Cost Records ☒ Readily available ☒ Up to date ☐ Funding mechanism/agreement in place ☐ Unavailable Original O&M cost estimate: _____ ☐ Breakdown attached Total annual cost by year for review period if available <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 25%;">From: _____</td> <td style="width: 25%;">To: _____</td> <td style="width: 25%;">_____</td> <td style="width: 25%; text-align: right;"> ☐ Breakdown attached </td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From: _____</td> <td>To: _____</td> <td>_____</td> <td style="text-align: right;"> ☐ Breakdown attached </td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From: _____</td> <td>To: _____</td> <td>_____</td> <td style="text-align: right;"> ☐ Breakdown attached </td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From: _____</td> <td>To: _____</td> <td>_____</td> <td style="text-align: right;"> ☐ Breakdown attached </td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> <tr> <td>From: _____</td> <td>To: _____</td> <td>_____</td> <td style="text-align: right;"> ☐ Breakdown attached </td> </tr> <tr> <td style="text-align: center;">Date</td> <td style="text-align: center;">Date</td> <td style="text-align: center;">Total cost</td> <td></td> </tr> </table>				From: _____	To: _____	_____	☐ Breakdown attached	Date	Date	Total cost		From: _____	To: _____	_____	☐ Breakdown attached	Date	Date	Total cost		From: _____	To: _____	_____	☐ Breakdown attached	Date	Date	Total cost		From: _____	To: _____	_____	☐ Breakdown attached	Date	Date	Total cost		From: _____	To: _____	_____	☐ Breakdown attached	Date	Date	Total cost	
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From: _____	To: _____	_____	☐ Breakdown attached																																								
Date	Date	Total cost																																									
3. Unanticipated or Unusually High O&M Costs during Review Period Describe costs and reasons: _____																																											
V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A																																											
A. Fencing																																											
1. Fencing Damaged ☐ Location shown on site map ☒ Gates secured ☐ N/A Remarks: <u>Fence in good condition, restricts access to the groundwater extraction and treatment system, offices and landfill.</u>																																											
B. Other Access Restrictions																																											
1. Signs and Other Security Measures ☐ Location shown on site map ☐ N/A Remarks: <u>Signs are present at both entrances to the Site.</u>																																											
C. Institutional Controls (ICs)																																											

1. Implementation and Enforcement			
Site conditions imply ICs not properly implemented	☐ Yes	☒ No	☐ N/A
Site conditions imply ICs not being fully enforced	☐ Yes	☒ No	☐ N/A
Type of monitoring (e.g., self-reporting, drive by): <u>self-reporting</u>			
Frequency: <u>constant on-site presence, quarterly monitoring in area</u>			
Responsible party/agency: <u>county and state</u>			
Contact _____	_____	_____	_____
Name	Title	Date	Phone no.
Reporting is up to date		☒ Yes	☐ No
Reports are verified by the lead agency		☐ Yes	☐ No
Specific requirements in deed or decision documents have been met		☒ Yes	☐ No
Violations have been reported		☐ Yes	☒ No
Other problems or suggestions: ☐ Report attached			

2. Adequacy ☒ ICs are adequate	☐ ICs are inadequate	☐ N/A
Remarks: _____		

D. General		
1. Vandalism/Trespassing	☐ Location shown on site map	☒ No vandalism evident
Remarks: _____		
2. Land Use Changes On Site	☒ N/A	
Remarks: _____		
3. Land Use Changes Off Site	☐ N/A	
Remarks: <u>The area continues to slowly fill in with more rural residential properties.</u>		

VI. GENERAL SITE CONDITIONS		
A. Roads	☒ Applicable	☐ N/A
1. Roads Damaged	☐ Location shown on site map	☒ Roads adequate
☐ N/A		
Remarks: _____		
B. Other Site Conditions		
Remarks: _____		

VII. LANDFILL COVERS		
	☐ Applicable	☒ N/A

VIII. VERTICAL BARRIER WALLS		
	☐ Applicable	☒ N/A

IX. GROUNDWATER/SURFACE WATER REMEDIES		
	☒ Applicable	☐ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines		☒ Applicable	☐ N/A
1. Pumps, Wellhead Plumbing and Electrical	☒ Good condition	☒ All required wells properly operating	☒ Needs maintenance
☐ N/A			
Remarks: _____			

2.	Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances ☒ Good condition ☐ Needs maintenance Remarks: _____
3.	Spare Parts and Equipment ☒ Readily available ☒ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks: _____
B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A	
1.	Collection Structures, Pumps and Electrical ☐ Good condition ☐ Needs maintenance Remarks: _____
2.	Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances ☐ Good condition ☐ Needs maintenance Remarks: _____
3.	Spare Parts and Equipment ☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided Remarks: _____
C. Treatment System ☒ Applicable ☐ N/A	
1.	Treatment Train (check components that apply) ☐ Metals removal ☐ Oil/water separation ☐ Bioremediation ☒ Air stripping ☒ Carbon adsorbers ☐ Filters: _____ ☒ Additive (e.g., chelation agent, flocculent): <u>Scale control</u> ☐ Others: _____ ☒ Good condition ☐ Needs maintenance ☒ Sampling ports properly marked and functional ☐ Sampling/maintenance log displayed and up to date ☒ Equipment properly identified ☐ Quantity of groundwater treated annually: _____ ☐ Quantity of surface water treated annually: _____ Remarks: <u>Pump-and-treat system is currently in standby mode and extraction wells are run quarterly.</u>
2.	Electrical Enclosures and Panels (properly rated and functional) ☐ N/A ☒ Good condition ☐ Needs maintenance Remarks: _____
3.	Tanks, Vaults, Storage Vessels ☐ N/A ☒ Good condition ☒ Proper secondary containment ☐ Needs maintenance

Remarks: _____	
4.	Discharge Structure and Appurtenances ☐ N/A ☒ Good condition ☐ Needs maintenance Remarks: _____
5.	Treatment Building(s) ☐ N/A ☒ Good condition (esp. roof and doorways) ☐ Needs repair ☒ Chemicals and equipment properly stored Remarks: _____
6.	Monitoring Wells (pump and treatment remedy) ☒ Properly secured/locked ☒ Functioning ☒ Routinely sampled ☒ Good condition ☐ All required wells located ☐ Needs maintenance ☐ N/A Remarks: _____
D. Monitoring Data	
1.	Monitoring Data ☒ Is routinely submitted on time ☒ Is of acceptable quality
2.	Monitoring Data Suggests: ☒ Groundwater plume is effectively contained ☒ Contaminant concentrations are declining
E. Monitored Natural Attenuation	
1.	Monitoring Wells (natural attenuation remedy) ☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition ☐ All required wells located ☐ Needs maintenance ☒ N/A Remarks: _____
X. OTHER REMEDIES	
If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.	
XI. OVERALL OBSERVATIONS	
A.	Implementation of the Remedy Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). <u>The remedy consists of a groundwater extraction and treatment system that is currently in standby mode, and an alternate water supply for nearby residences. The extraction and treatment system, designed to contain contaminated groundwater and prevent migration, has been on standby mode since 2014. See data review section for more details on status of groundwater contamination.</u>
B.	Adequacy of O&M Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. <u>O&M activities are conducted regularly and the Site, the extraction and treatment system and the landfill cover were in excellent condition.</u>
C.	Early Indicators of Potential Remedy Problems

	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. <u>None.</u>
D.	Opportunities for Optimization
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. <u>None.</u>

APPENDIX G – SITE INSPECTION PHOTOS



Signage at entrance of groundwater extraction and treatment facility



Groundwater extraction and treatment tower and building



Piping inside groundwater extraction and treatment facility



Fencing along landfill



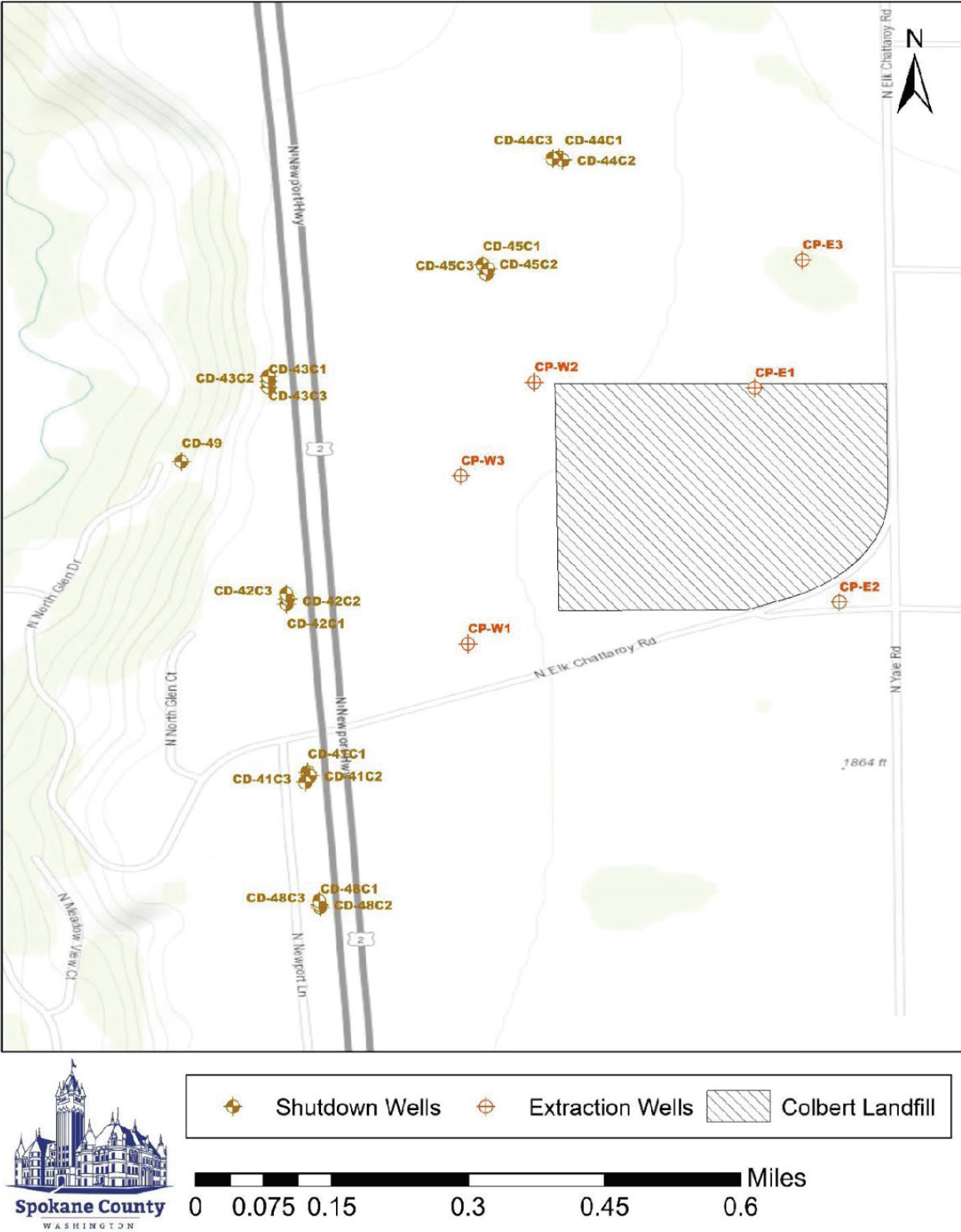
CP-W2 vault



CP-S6

APPENDIX H – FIGURES AND CHARTS

Figure H-1: Shutdown Test Locations



Source: The Site's 2024 Annual Report.

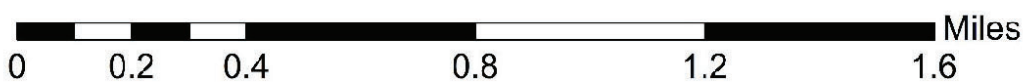
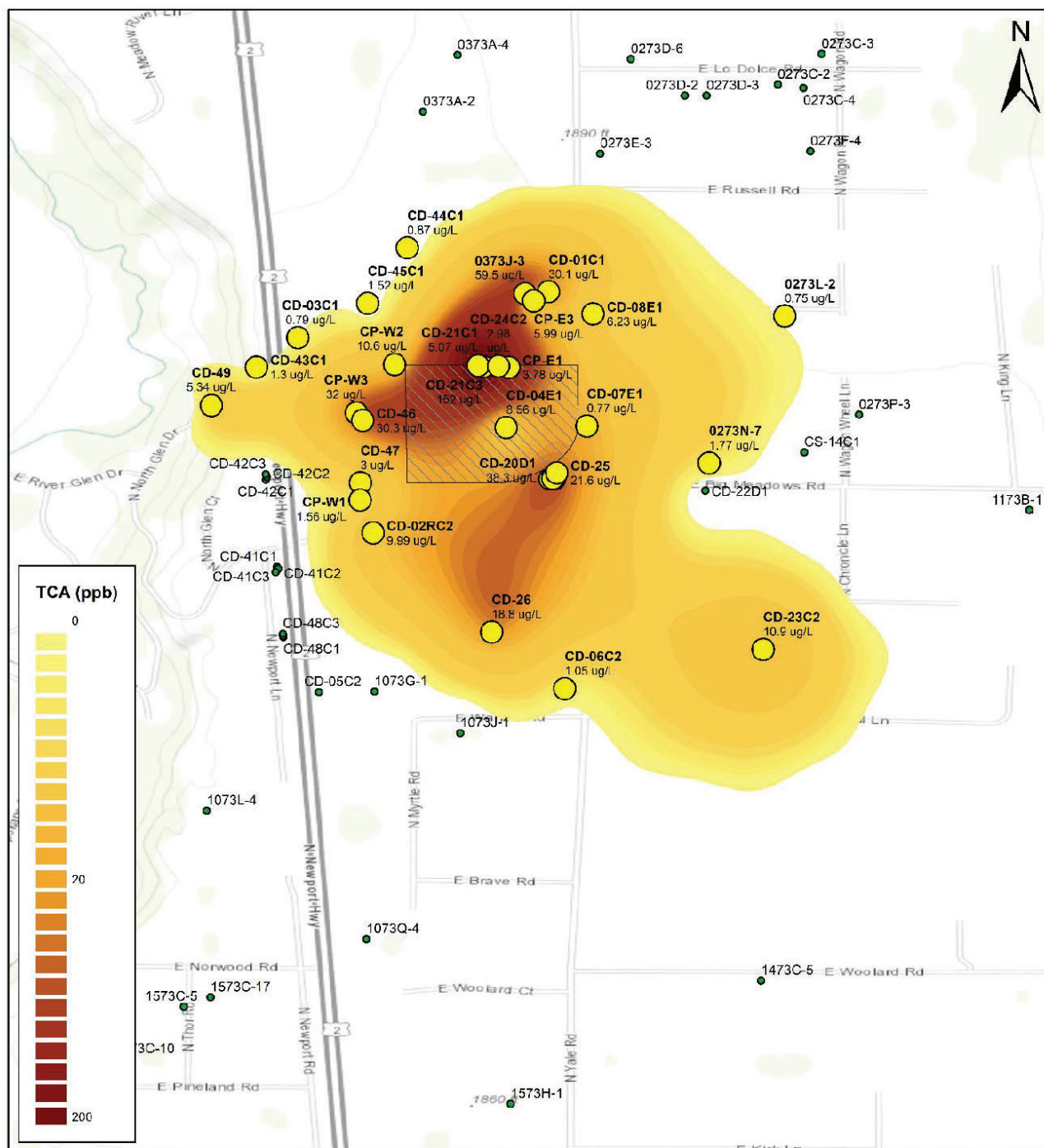
Legend:

- Supplemental
- Residential
- Compliance Monitoring
- Shutdown
- MFS Monitoring
- Colbert Landfill

Scale: 0 to 1.6 Miles

H-2

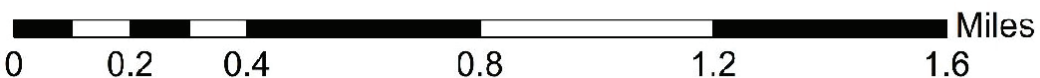
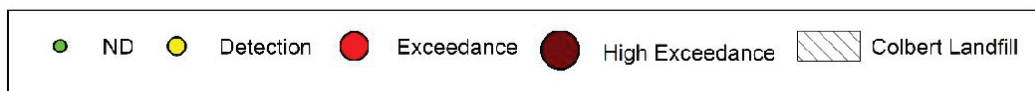
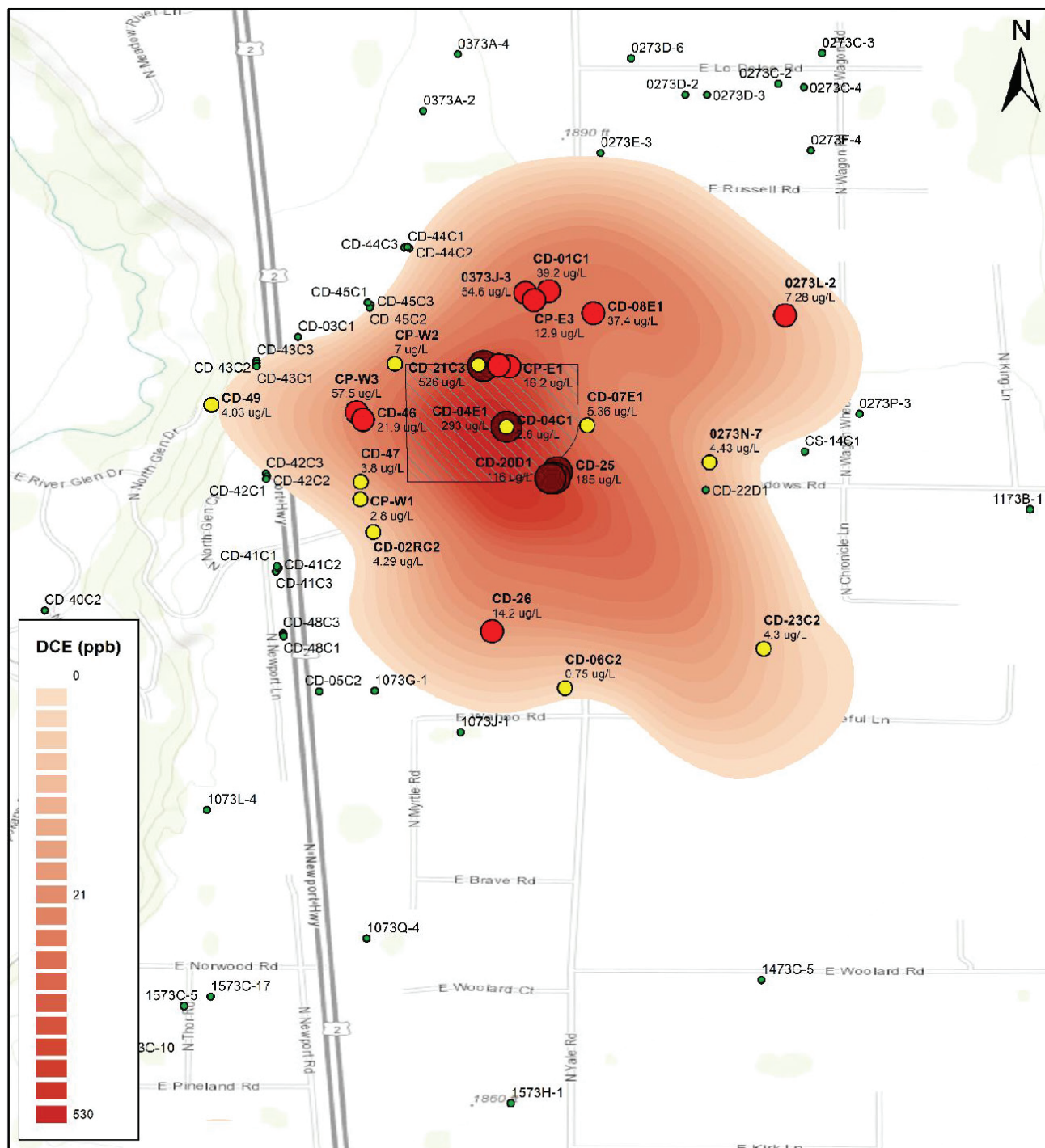
Figure H-3: Lower Aquifer TCA Detections Map



Source: The Site's 2024 Annual Report.

H-4

Figure H-5: Lower Aquifer DCE Detections Map



Source: The Site's 2024 Annual Report.

H-6

The map displays TCE concentrations in the Spokane River area. A red shaded area indicates high concentrations, with a legend showing a color scale from 0 to 245 ppb. Sampling points are marked with colored circles: green for ND (Not Detected), yellow for Detection, orange for Exceedance, and red for High Exceedance. A hatched area represents the Colbert Landfill. The map includes a scale bar in miles (0 to 1.6) and a north arrow.

TCE (ppb) Legend:

- 0
- 14
- 245

Sampling Points and Concentrations:

- CD-44C3, CD-44C1, CD-44C2
- CD-45C1, CD-45C3, CD-45C2
- CD-03C1, CD-43C3, CD-43C2, CD-43C1, CD-49
- CD-42C3, CD-42C2, CD-42C1
- CD-41C1, CD-41C3, CD-41C2
- CD-48C3, CD-48C1
- CD-05C2, 1073G-1
- CD-26, 52.4 ug/L
- CD-23C2, 1.85 ug/L
- CD-20D1, 10.2 ug/L
- CD-20D2, 118 ug/L
- CD-04E1, 12.2 ug/L
- CD-04C1, 200 ug/L
- CD-07E1
- CD-02RC2, 1.82 ug/L
- CP-W1
- CP-W2, 51.7 ug/L
- CP-W3, 26.3 ug/L
- CD-46, 26.3 ug/L
- CD-21C3, 12 ug/L
- CD-24C2, 6.39 ug/L
- CP-E3, 1.82 ug/L
- CD-01C1
- CD-08E1, 5.99 ug/L
- CP-E1, 8.71 ug/L
- CP-E2, 200 ug/L
- 0273D-6, 0273D-2, 0273D-3, 0273D-3
- 0273E-3
- 0273C-3, 0273C-2, 0273C-4
- 0273F-4
- 0273L-2
- 0273N-7, 2.03 ug/L
- CD-22D1
- CS-14C1
- 0273P-3
- 1173B-1
- 1073L-4
- 1573C-5, 1573C-17, 1573C-10
- 1573H-1
- 1473C-5
- 1073Q-4
- 1073J-1
- 1860
- 1890

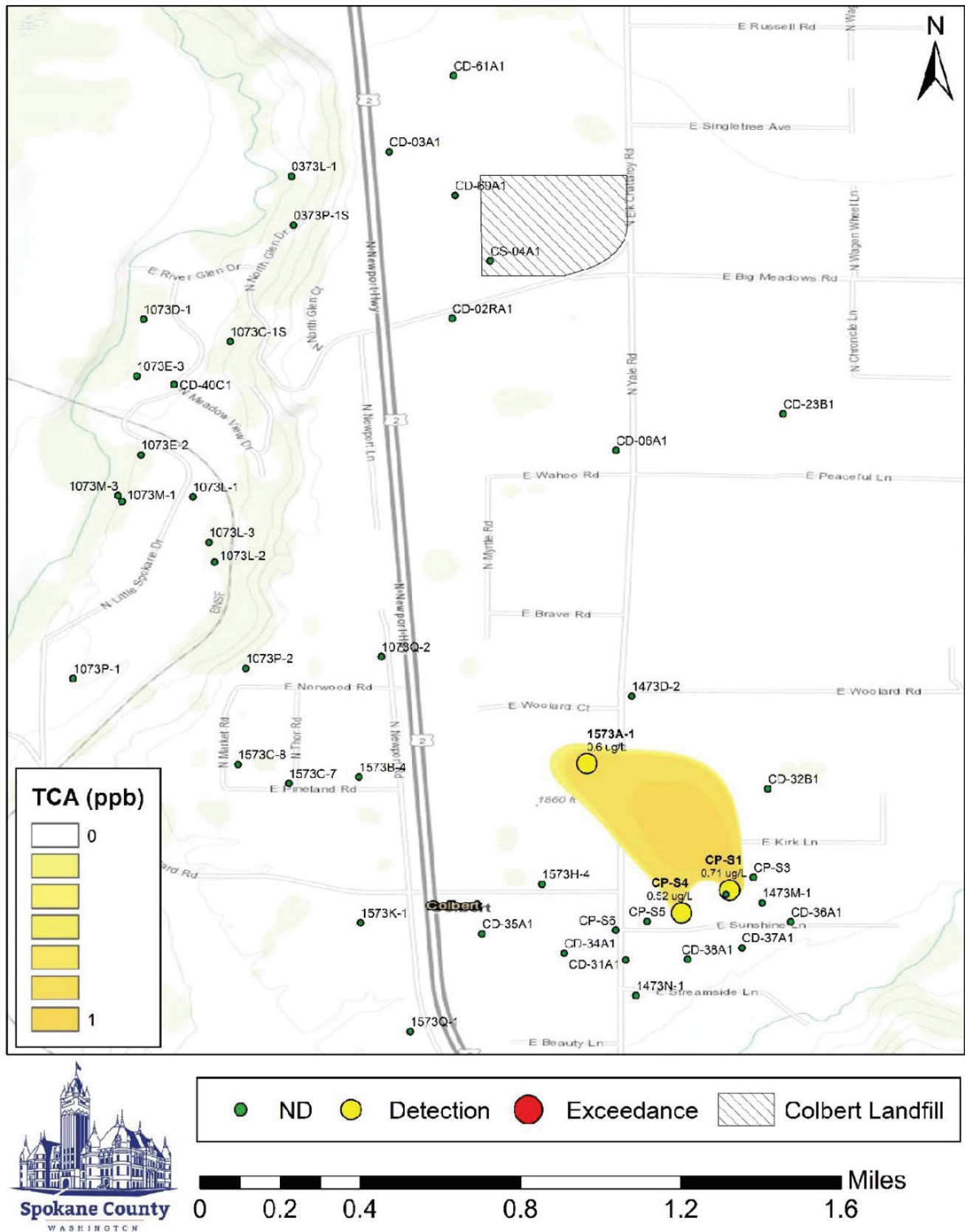
Legend:

- ND (Not Detected)
- Detection
- Exceedance
- High Exceedance
- Colbert Landfill

Scale: 0 to 1.6 Miles

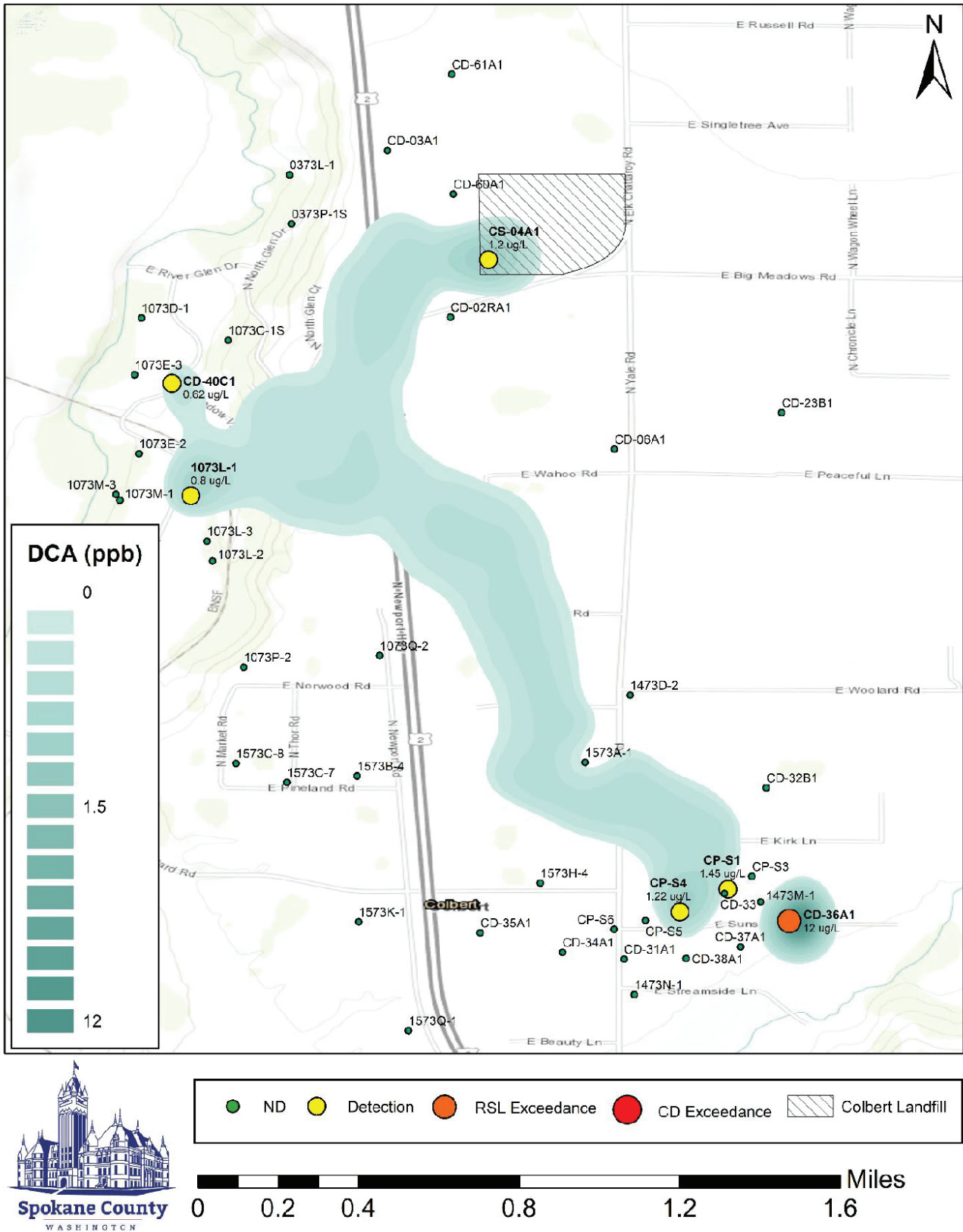
H-7

Figure H-8: Upper Aquifer TCA Detections Map



Source: The Site's 2024 Annual Report.

Figure H-9: Upper Aquifer DCA Detections Map



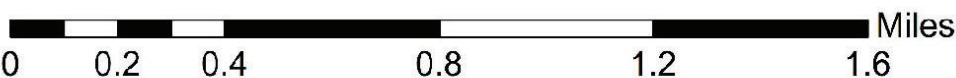
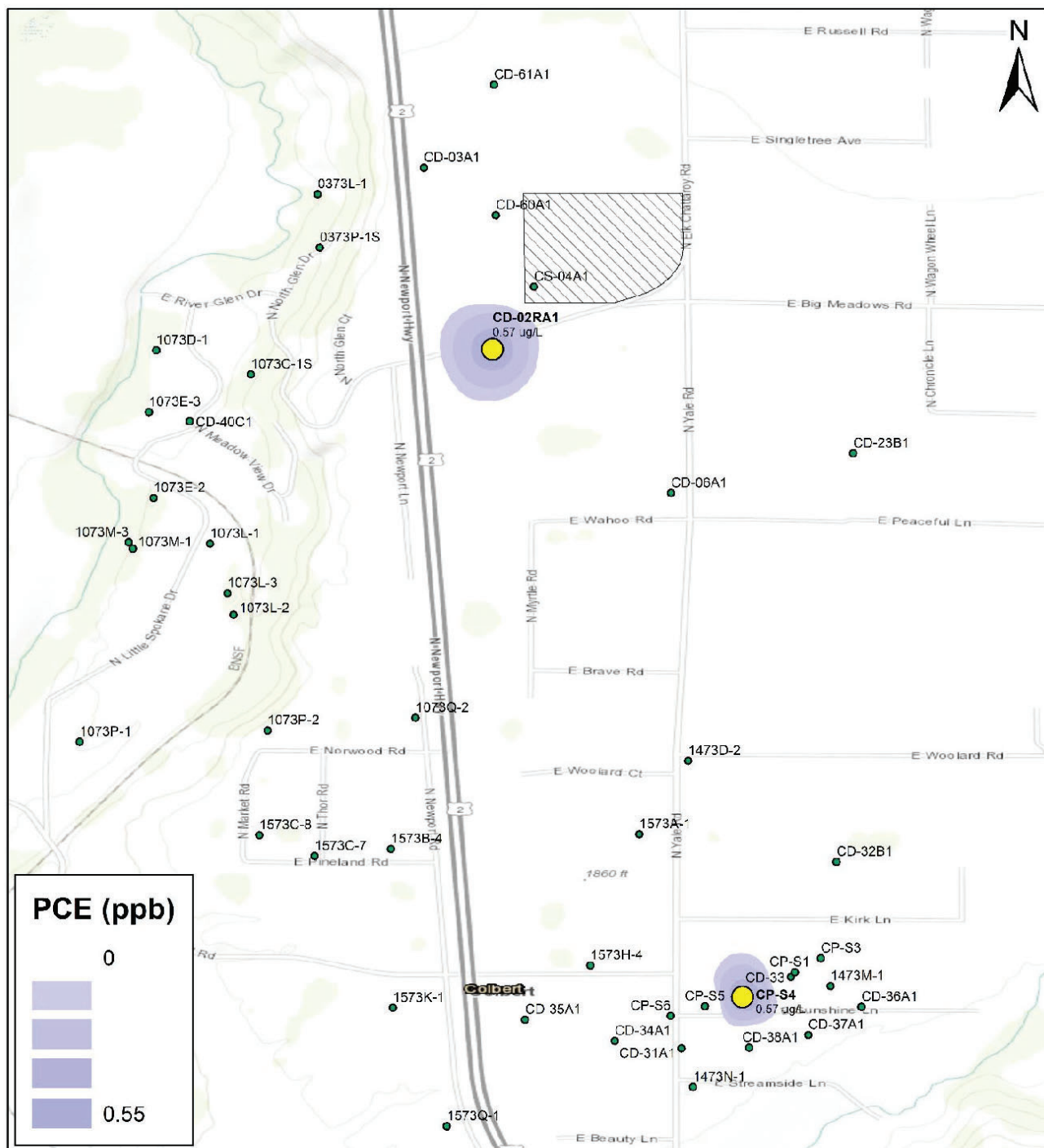
Source: The Site's 2024 Annual Report.

Figure H-10: Upper Aquifer DCE Detections Map



Source: The Site's 2024 Annual Report.

Figure H-11: Upper Aquifer PCE Detections Map



Source: The Site's 2024 Annual Report.

TCE (ppb)

0

1

2

Legend:

- ND (Not Detected)
- Detection
- Exceedance
- High Exceedance
- Colbert Landfill

Scale: 0 to 1.6 Miles

Spokane County

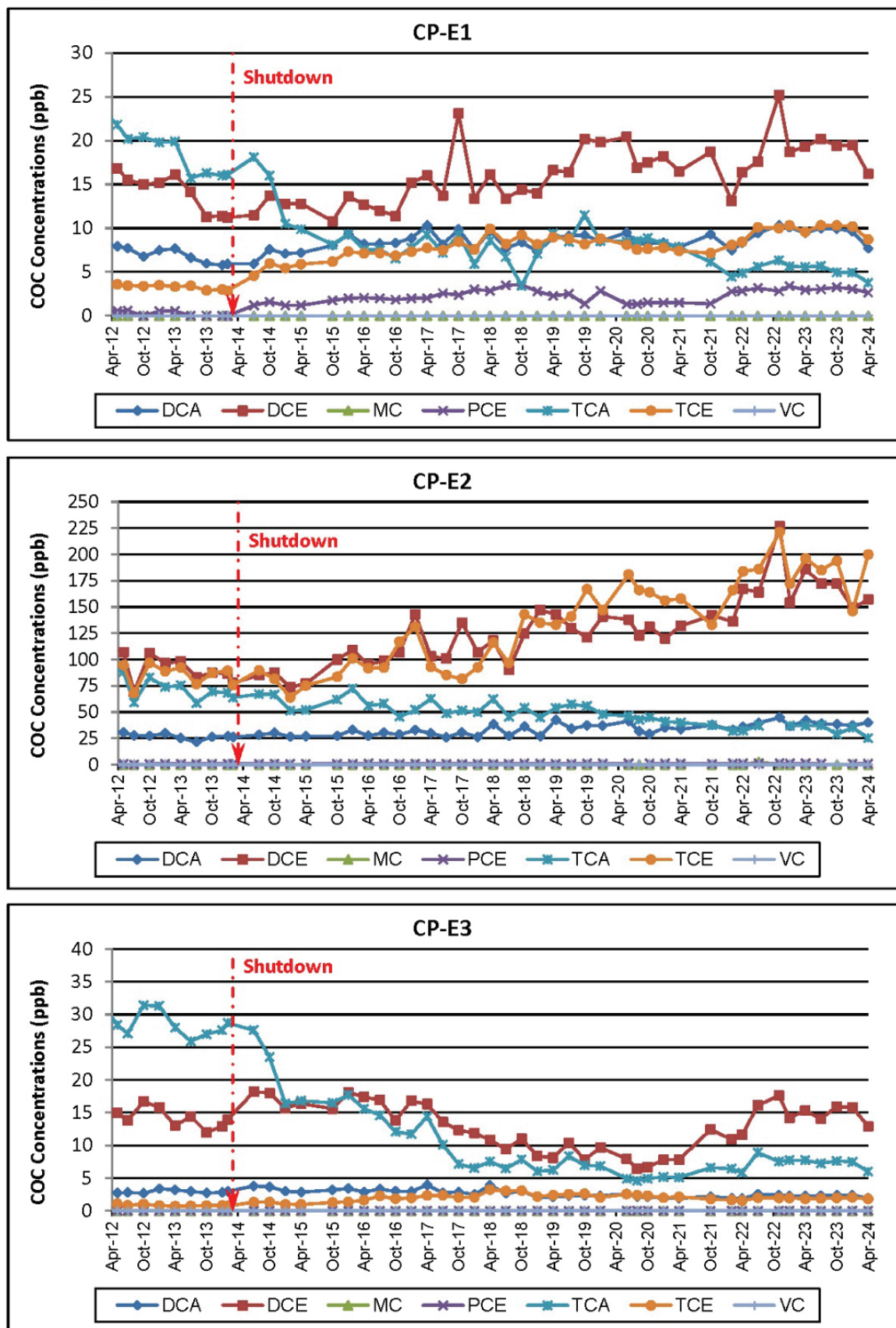
WASHINGTON

H-12

Map of Spokane County, Washington, showing well locations and the Colbert Landfill. The map includes a legend for Upper Aquifer Supp. Wells (orange circle with a cross), Lower Aquifer Supp. Wells (blue circle with a cross), and Colbert Landfill (hatched area). A scale bar at the bottom indicates distances from 0 to 2 miles. The date 'May 2022' is noted in the bottom right corner. The map shows various roads, including E River Glen Dr, N Northport Rd, E Wahoo Rd, and E Woolard Rd, and features like the Snake River and the Colbert Landfill area.

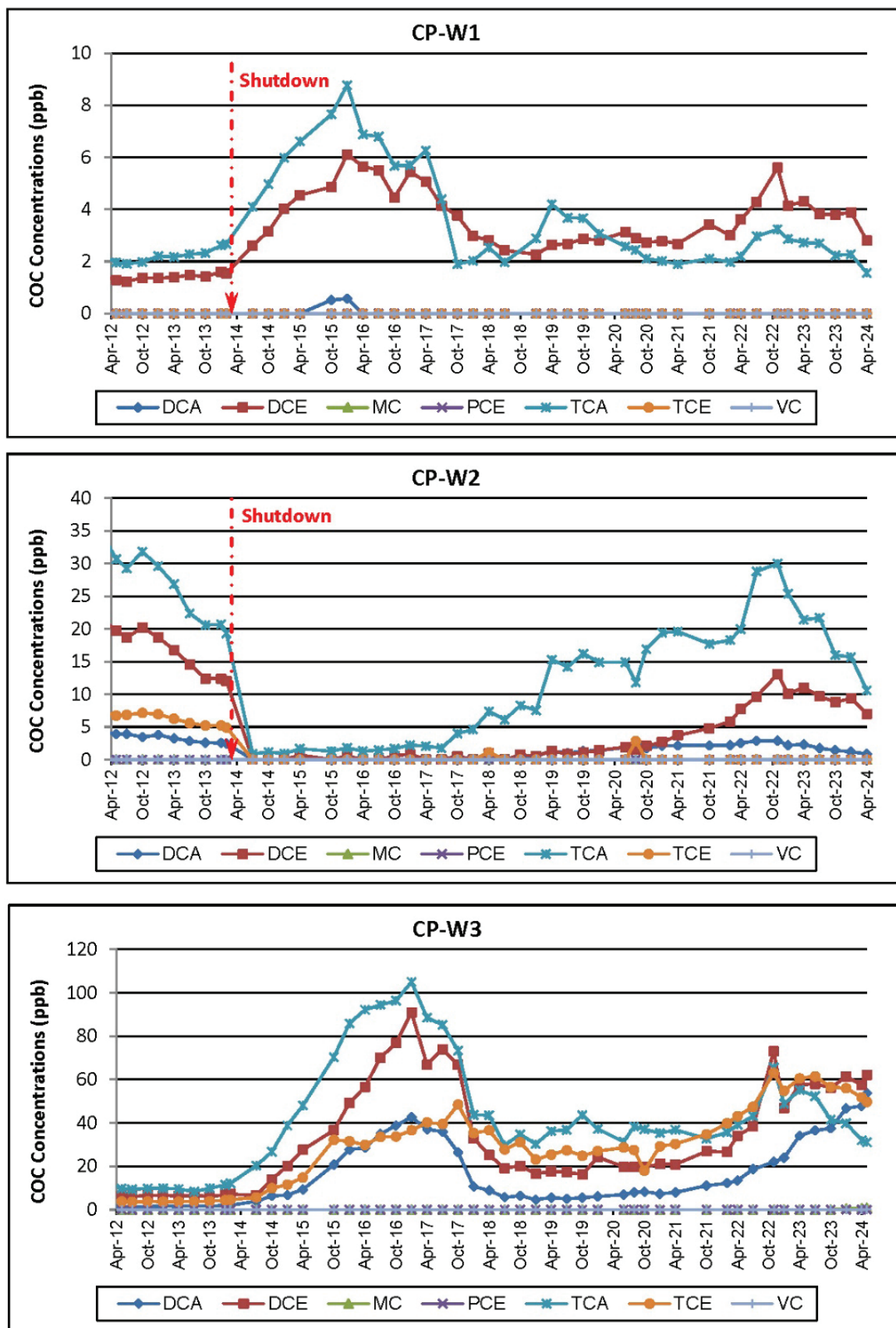
H-13

Chart H-1: Lower Aquifer Eastern Extraction Wells – COC Concentrations Versus Time



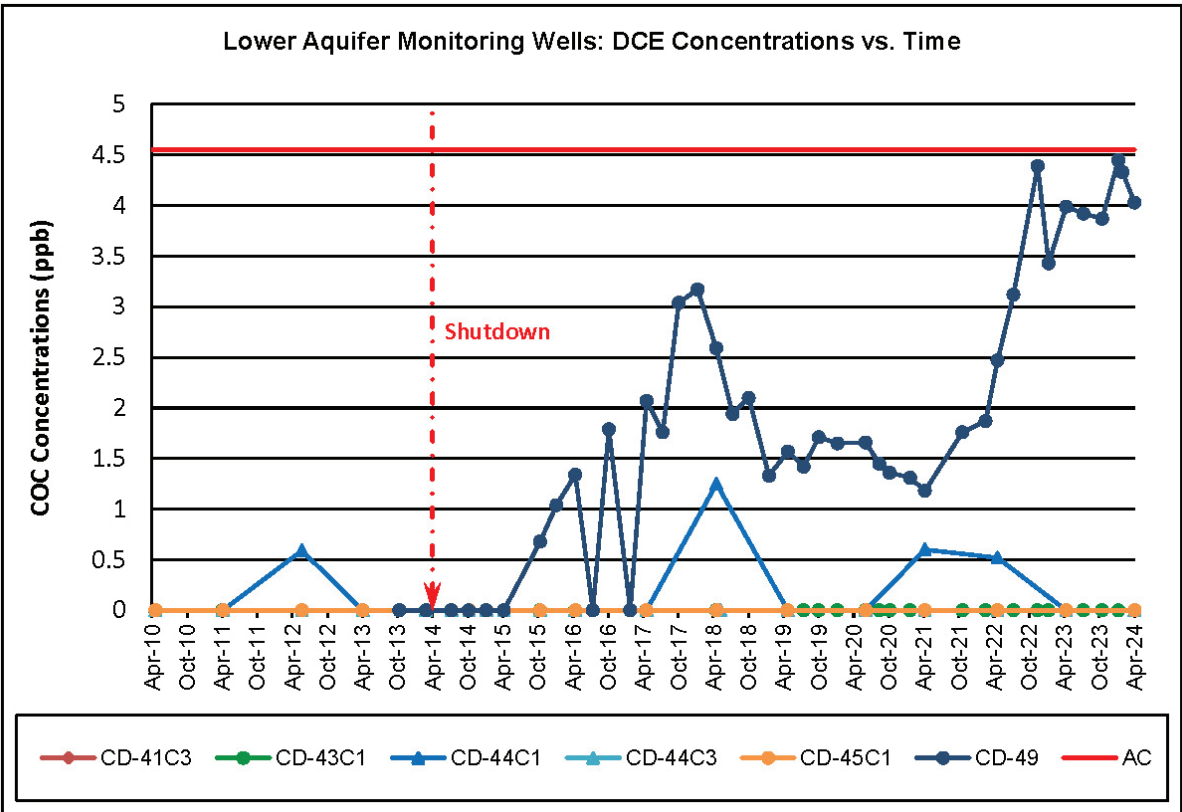
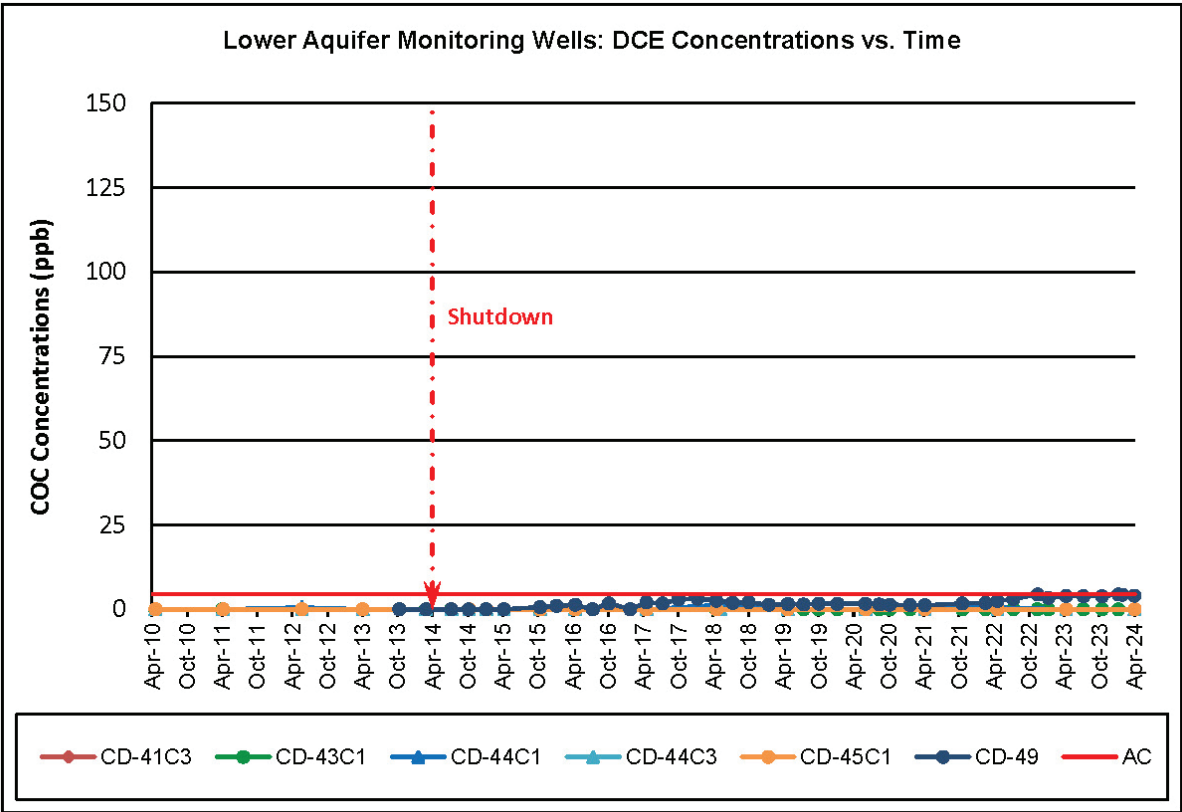
Source: The Site's 2024 Annual Report.

Chart H-2: Lower Aquifer Western Extraction Wells – COC Concentrations Versus Time



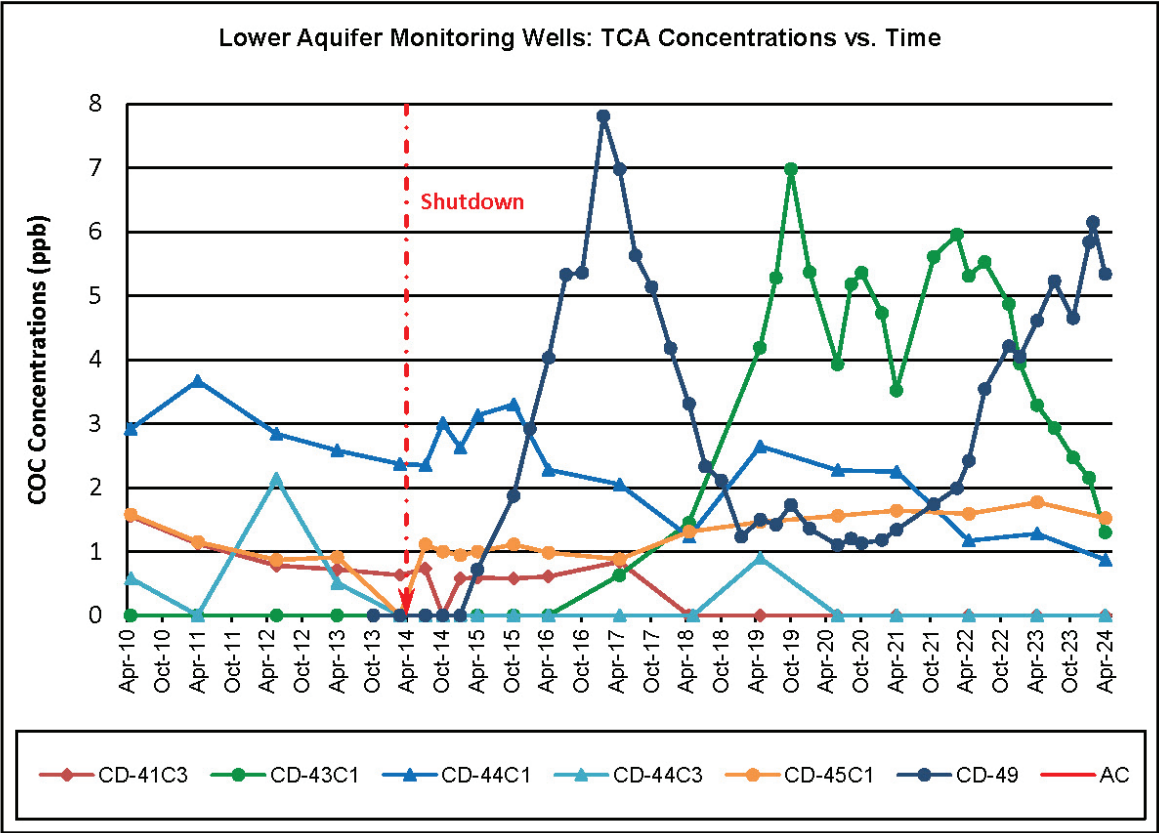
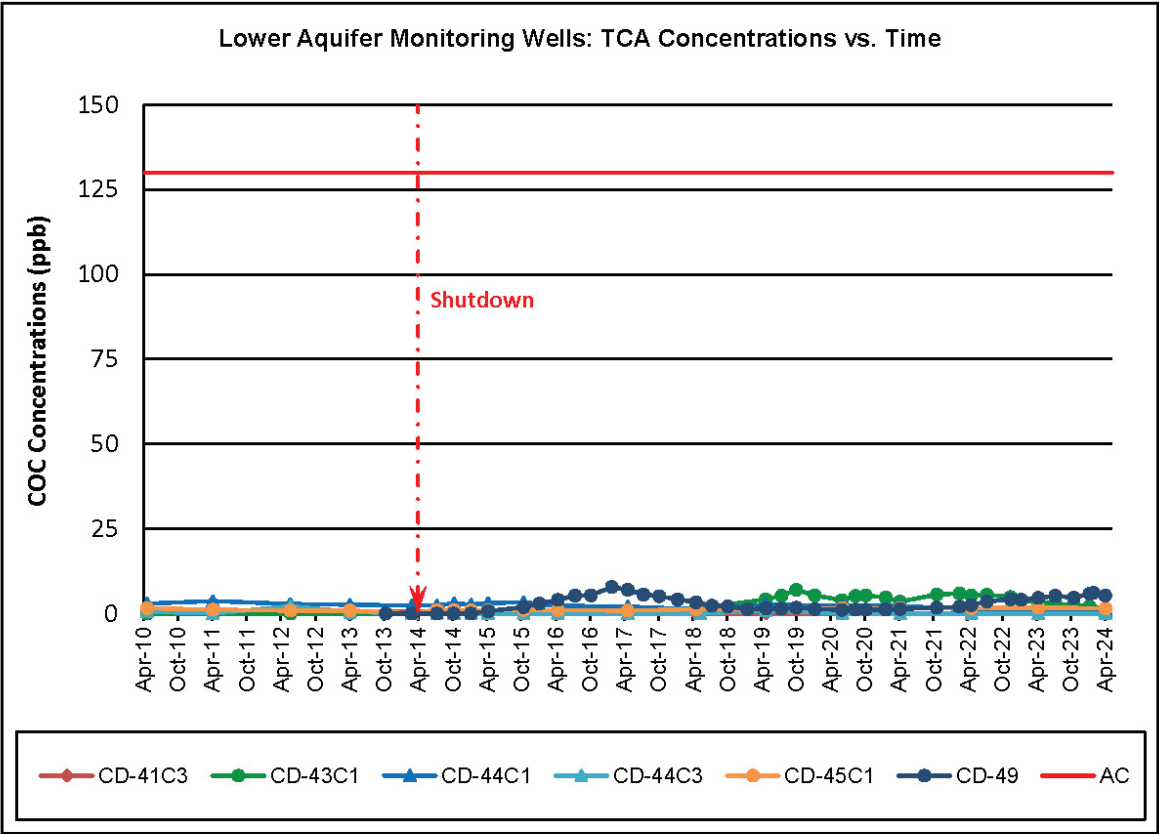
Source: The Site's 2024 Annual Report.

Chart H-3: Lower Aquifer Compliance Wells – 1,1-DCE Concentrations Versus Time



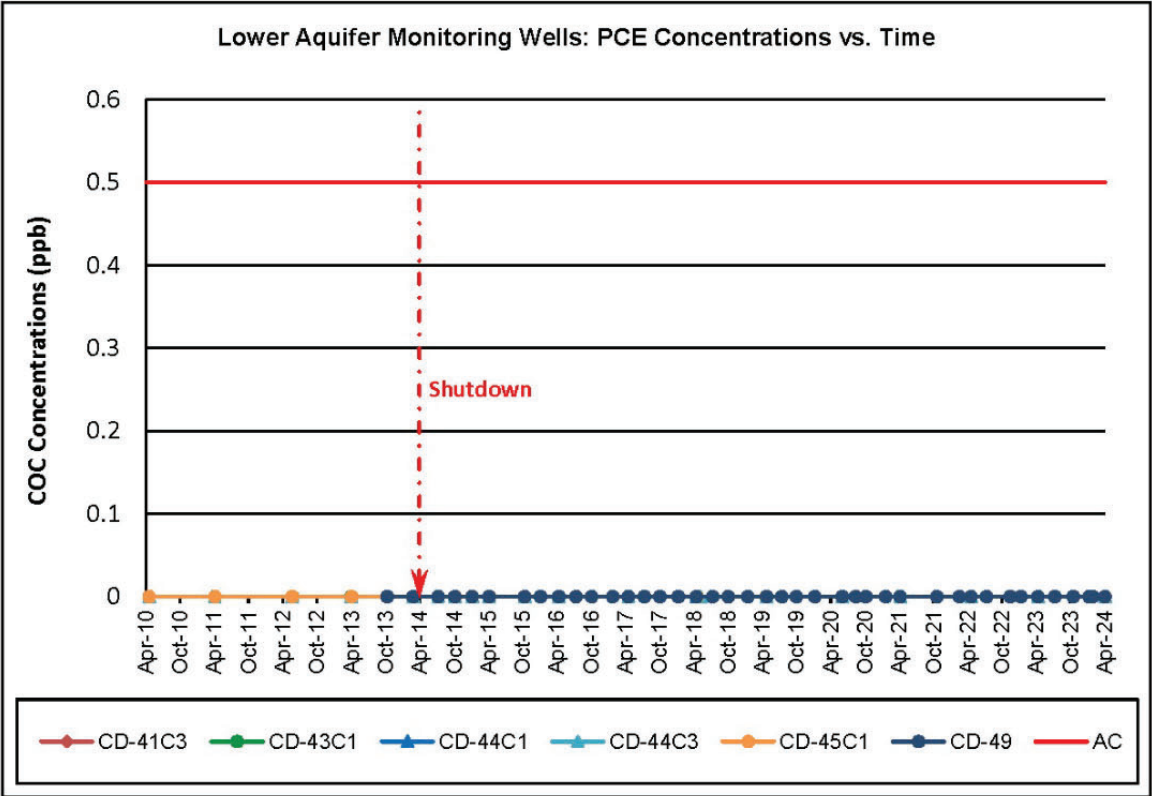
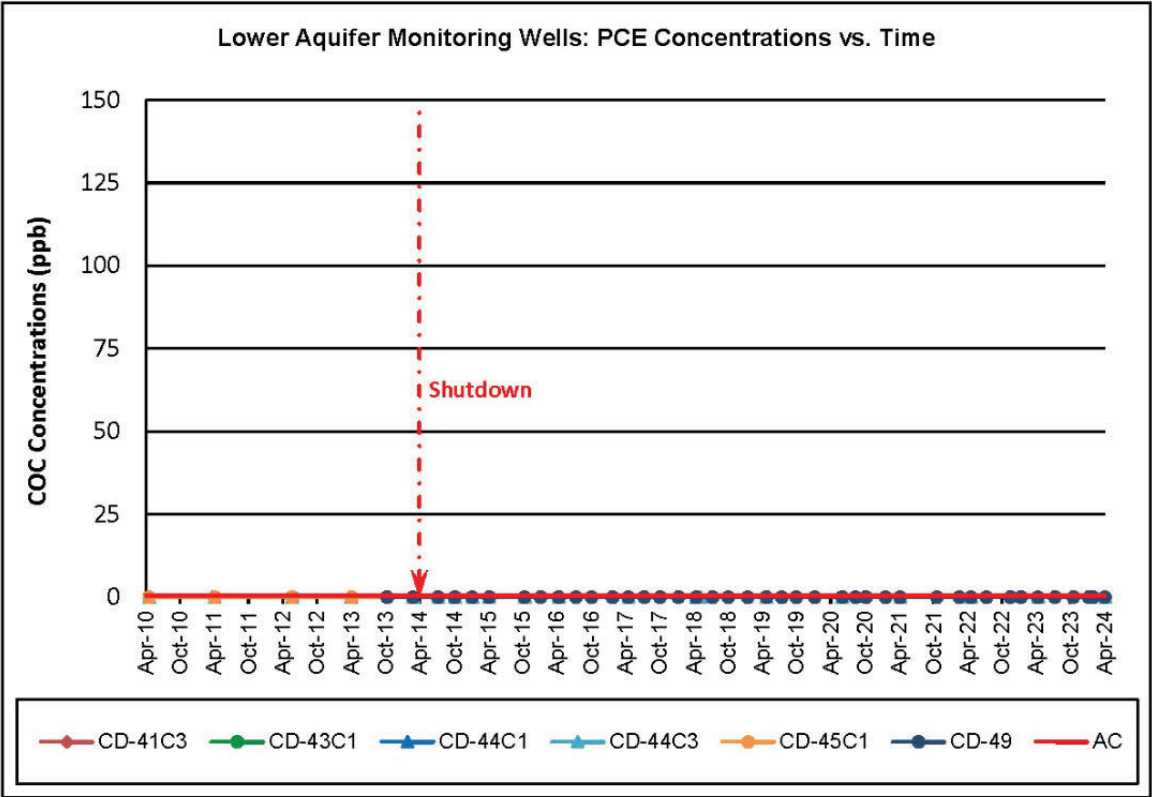
Source: The Site's 2024 Annual Report.

Chart H-4: Lower Aquifer Compliance Wells – TCA Concentrations Versus Time



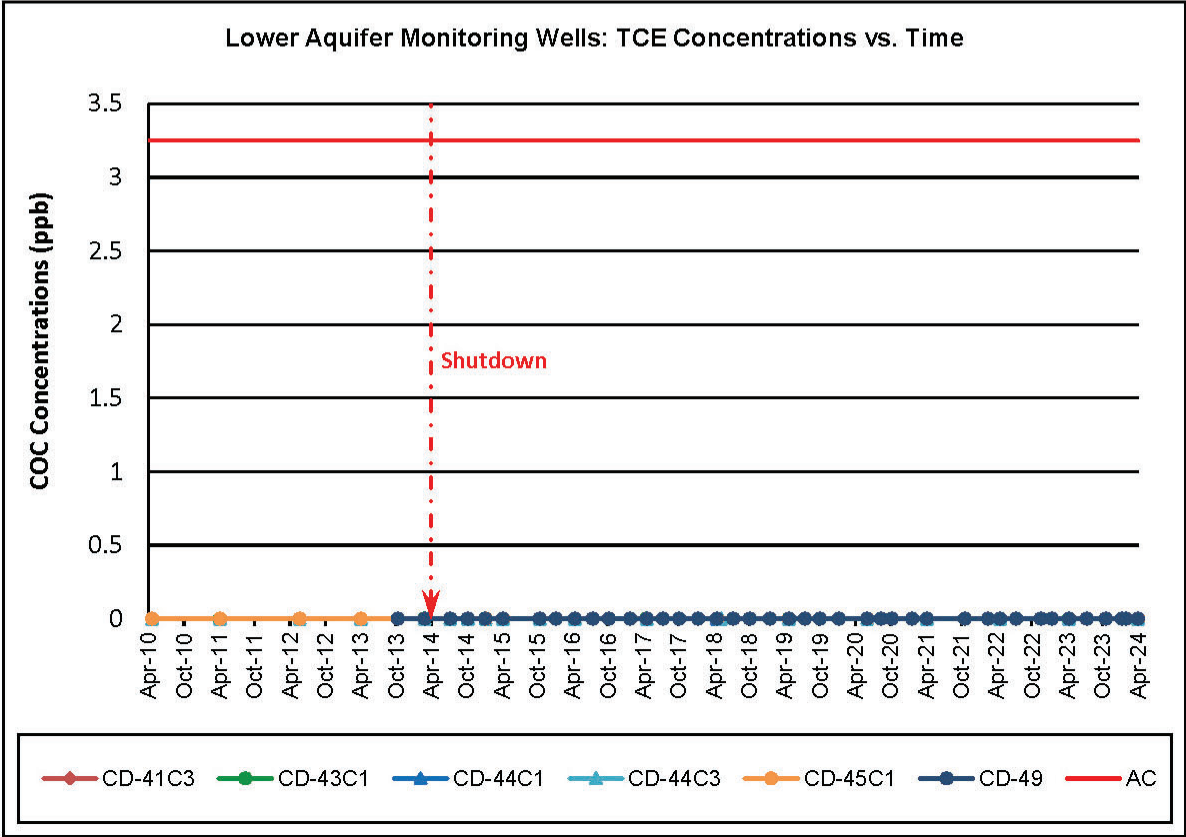
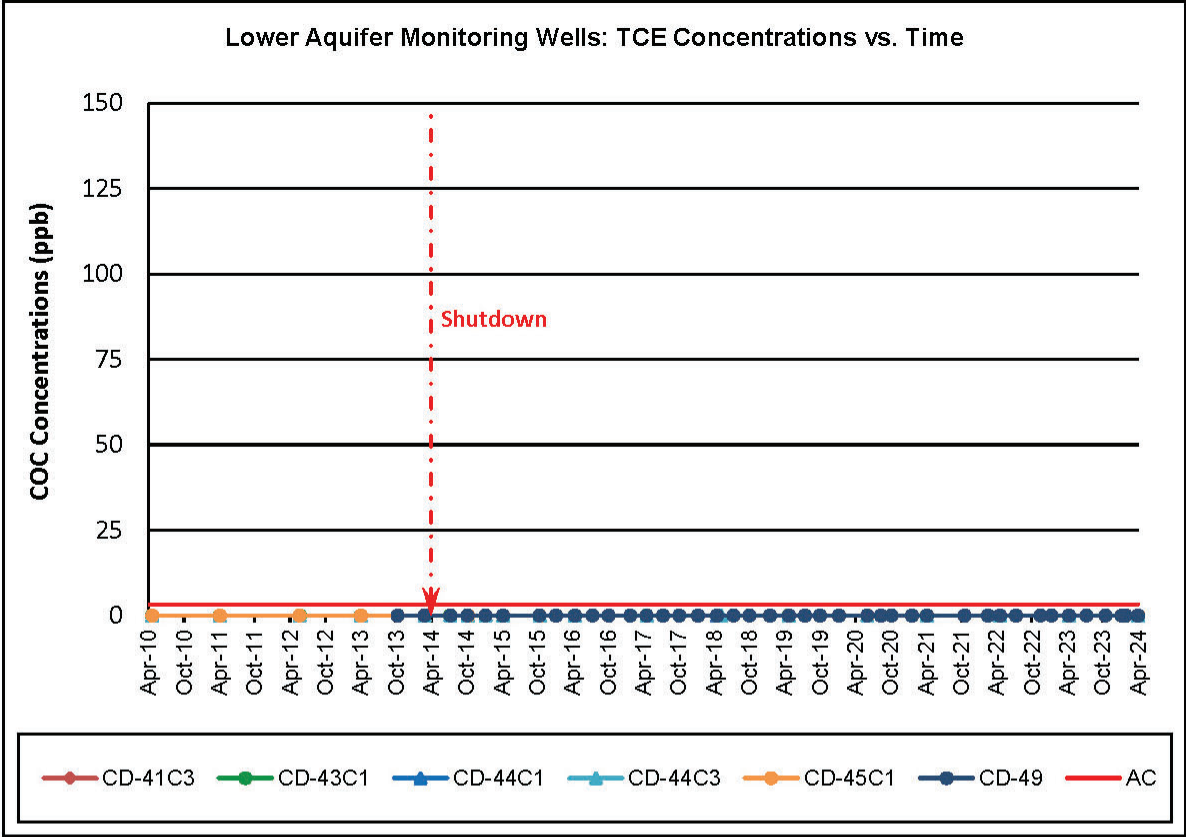
Source: The Site's 2024 Annual Report.

Chart H-5: Lower Aquifer Compliance Wells – PCE Concentrations Versus Time



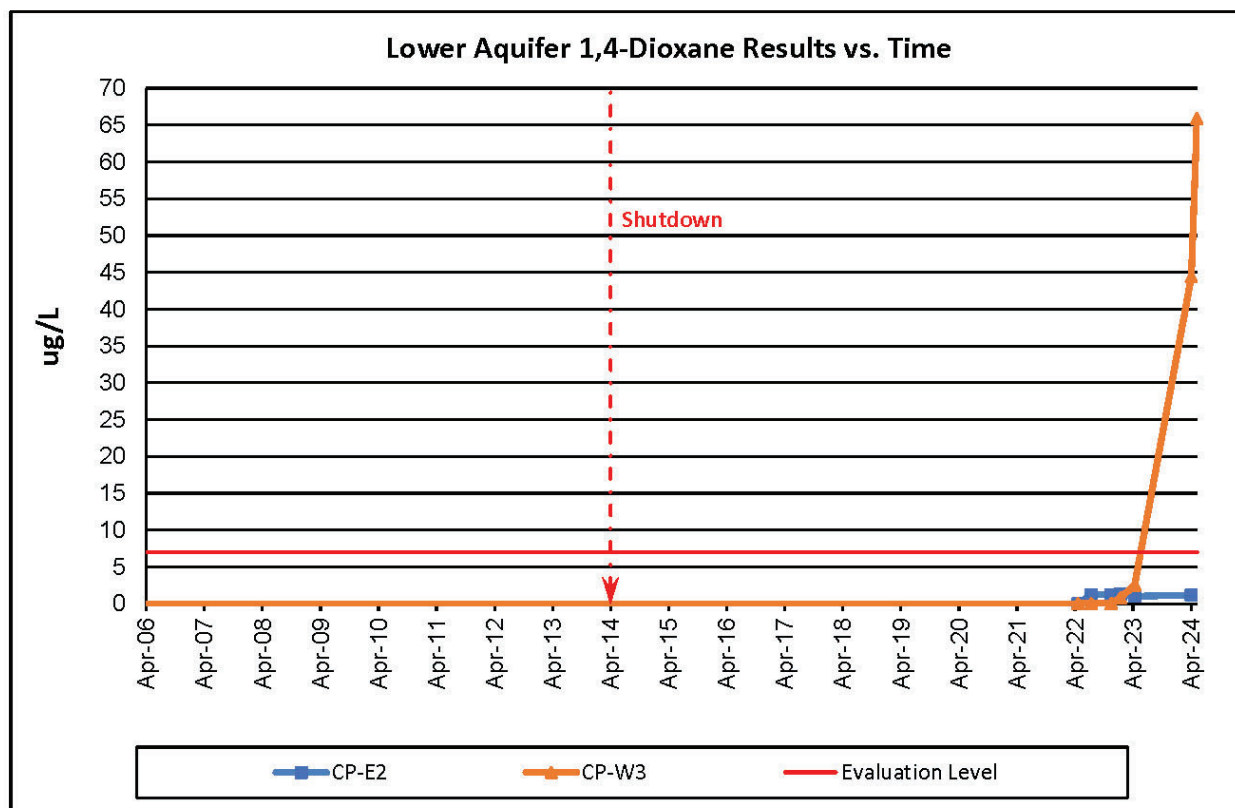
Source: The Site's 2024 Annual Report.

Chart H-6: Lower Aquifer Compliance Wells – TCE Concentrations Versus Time



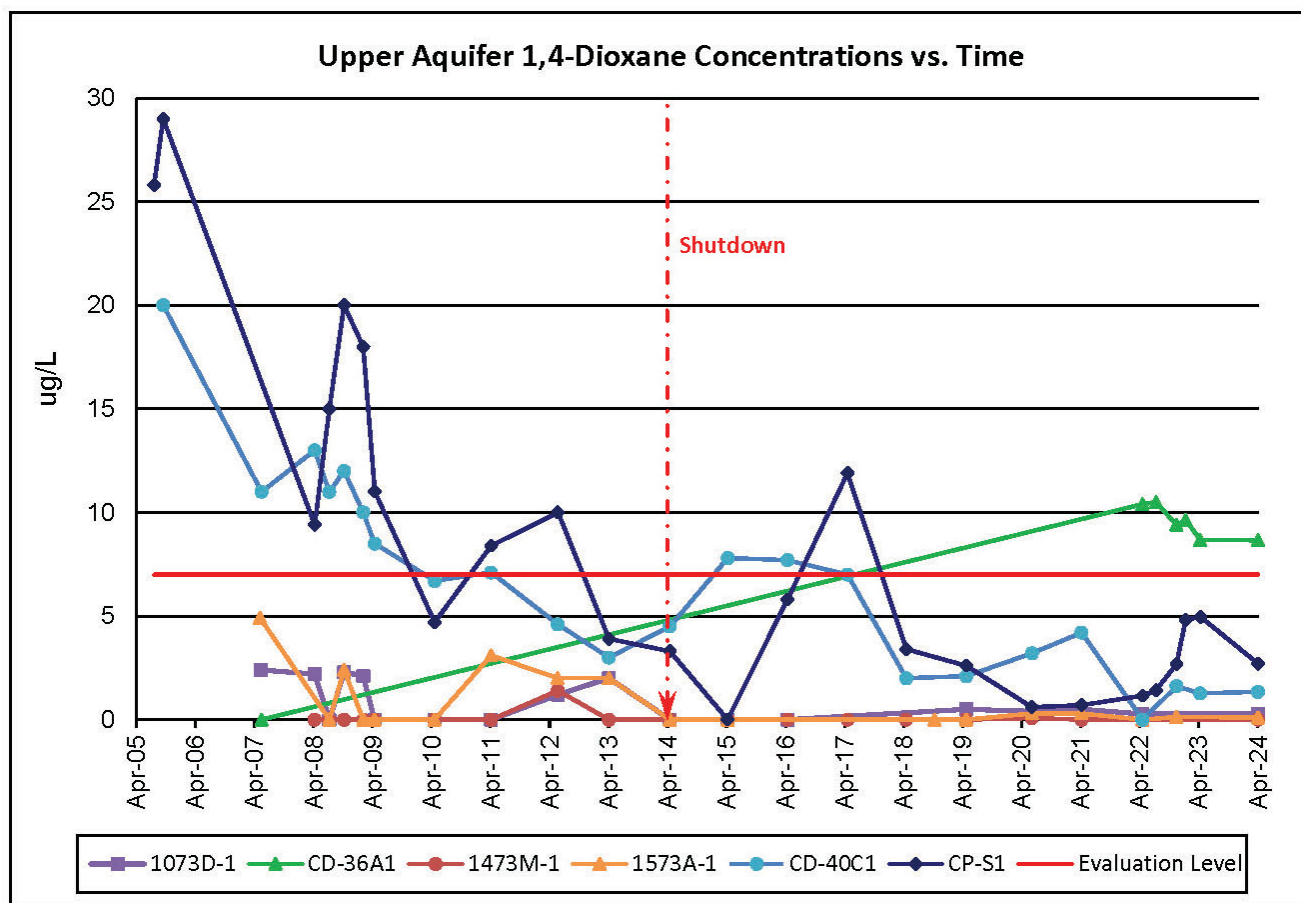
Source: The Site's 2024 Annual Report.

Chart H-7: Lower Aquifer Results – 1,4-Dioxane Concentrations Versus Time



Source: The Site's 2024 Annual Report.

Chart H-8: Upper Aquifer Results – 1,4-Dioxane Concentrations Versus Time



APPENDIX I – DETAILED ARARS REVIEW TABLES

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain “a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment.” The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate (ARAR). In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed. The IROD established chemical-specific ARARs for groundwater for select COCs. The chemical-specific ARARs are based on federal drinking water standards. With the exception of methylene chloride, the MCLs have not changed (Table I-1). In the IROD, the cleanup goal for PCE was risk-based. However, there is now an MCL for this COC. It is included in Table I-1.

Table I-1: Groundwater Performance Standard Review

Groundwater COC	IROD Performance Standard (µg/L)	Current MCL ^a (µg/L)	Change
1,1,1-TCA	200	200	No change
1,1-DCE	7	7	No change
1,1-DCA	4,050	No standard	No standard
TCE	5.0	5	No change
PCE	0.7	5 ^b	Less stringent
Methylene chloride ^c	2.5	0.5	More stringent
Notes: a. National primary drinking water regulations (unless otherwise noted), located at https://www.epa.gov/ground-water-and-drinking-water/national-primary-drinking-water-regulations (accessed 4/12/2024). b. IROD performance standard was risk-based; however, the current federal standard is listed. c. Listed as dichloromethane			

APPENDIX J – SCREENING-LEVEL RISK REVIEW

The groundwater cleanup goals for PCE and methylene chloride were risk-based in the IROD. 1,1-DCA was based on the MAC. The 1,1-DCA, PCE and methylene chloride groundwater cleanup goals were compared to current EPA residential tap water RSLs. The cleanup goals for PCE and methylene chloride remain below EPA's acceptable risk range for cancer and less than the hazard quotient (HQ) for non-cancer risk. The cleanup goal for 1,1-DCA exceeds EPA's acceptable risk range of 1.0×10^{-6} to 1.0×10^{-4} (Table J-1). This change was noted in the 2019 FYR Report, and Spokane County is using the current cancer-based RSL to screen the groundwater data.

Table J-1: Screening-Level Risk Evaluation of Risk-Based Groundwater Cleanup Goals

COC	Groundwater Performance Standard (µg/L)	Residential Tapwater RSL (µg/L)		Cancer Risk	Noncancer HQ
		Cancer-Based Risk = 1×10^{-6}	Noncancer HQ = 1		
1,1-DCA	4,050	2.8	3,800	1×10^{-3}	1
PCE	0.7	11	41	6×10^{-8}	0.02
Methylene chloride	2.5	11	110	2×10^{-7}	0.02

Notes:

Bold = exceeds EPA's acceptable risk range.

- RSLs obtained from EPA's website at <https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables> (accessed 4/12/2024).
- Cancer risks were calculated using the following equation, since RSLs are derived based on 10^{-6} risk: cancer risk = (cleanup level ÷ cancer RSL) $\times 10^{-6}$.
- Noncancer HQs were calculated using the following equation and reported as one significant figure, per EPA Region 4 risk assessment guidance: HQ = cleanup level ÷ RSL.